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## Commercial Aeronautics and Steel

Increasing Use of Ferrous Metals in Aircraft Building—Requirements, Purposes and Limitations Outlined

BY WILLIAM P. MAC CRACKEN, JR.

FROM the time Orville Wright first flew at Kitty Hawk, N. C., in December, 1903, down to the signing of the Armistice in November, 1918, practically all aircraft were constructed primarily of wood, wire and fabric. There was little ferrous metal used, except in the power plant.

During the period since the Armistice, ferrous metals have been used successfully in the construction of almost every part of an aircraft. From present indications it would appear that, with the increased application of aeronautics to commerce and industry, there would develop a substantial demand for iron and its alloys by the aircraft industry.

Ferrous metals used in the construction of air-

craft may be divided into five classes, depending upon their method of manufacture:

1. Sheet metals,
2. Bar metals,
3. Tube metals,
4. Wire metals,
5. Propellers.

### Relative Use

Fuselages, landing gears and control surfaces are usually now of metal construction, either steel or duralumin. Fuselages and control surfaces, such as ailerons, elevators, stabilizers and rudders, are generally of welded steel tube construction. Landing gears are more often made of alloy steel tubing. Duralumin has been used in each of these places, but not exten-



Possibilities of the Use of Steel in Connection with the Airplane Are Numerous, the All-Steel Hangar Being One Item. The planes at top and bottom of this page were the central figures in a group of nine at Kansas City, Kan., which were cared for in a steel hangar

sively as yet, probably because of its high cost. All three materials—steel, duralumin and wood—are in use for parts of the wing structure. Interplane struts are made of any one of the three, the choice in a given case depending mainly on the prejudices of the designer and the relative availability of the material.

Wing spars have been made of both steel and duralumin, but, in general, wood is still superior to metal for this purpose. Very few steel ribs have been built, owing to the exceedingly light-gage material required.

In brief, steel tubing has displaced wood for the construction of structural members, except in the wings, and it is constantly encroaching upon that province. As between the two metals, steel and duralumin, neither has obtained a general ascendancy. But it is believed that each will find its particular field, which will depend upon the size of the airplane as well as the location of the members in the airplane.

#### Sheet Steel

Sheet steel used in aircraft construction is a very important structural material. Physical properties are demanded which cannot be obtained in the ordinary commercial sheet steel, such as the hot-rolled sheet used for range boilers or the cold-rolled sheet used for automobile bodies. The principal difficulty encountered in manufacturing the sheet is the necessity for balanced physical properties, parallel and perpendicular to the length of the sheet. This difficulty increases with the increase in width of the sheet, especially over 12 in. Very satisfactory sheets can be obtained, however, which will meet the physical properties when manufactured from steel with a carbon content from 0.20 to 0.30 per cent, which has been properly annealed at the mill to modify the effects of cold working.

This type of steel bends easily and can be formed into intricate fittings without difficulty. It can be welded and brazed. A welding and brazing operation on this steel does not materially reduce the tensile strength and may increase it slightly, depending upon the method of cooling.

The sheet steel which has been developed as a standard for airplane fittings is a chrome-vanadium steel. This steel contains from 0.018 to 0.025 per cent

carbon and was selected because it can be easily welded and does not crack in bending and forming operations. The use of chrome-vanadium sheet steel with a tensile strength of more than 110,000 lb. per sq. in. is not recommended for airplane fittings subject to vibrations or shocks, such as flying and landing wire fittings and engine braces.

#### Bar Steel

Steels used in bar form in airplane construction are plain carbon steels. They should be used only in the heat-treated condition, where the high physical properties can be used advantageously. The bar steel in the above form is generally used for nuts, machine screws and other low-stressed structural steel parts.

#### Steel Tubing

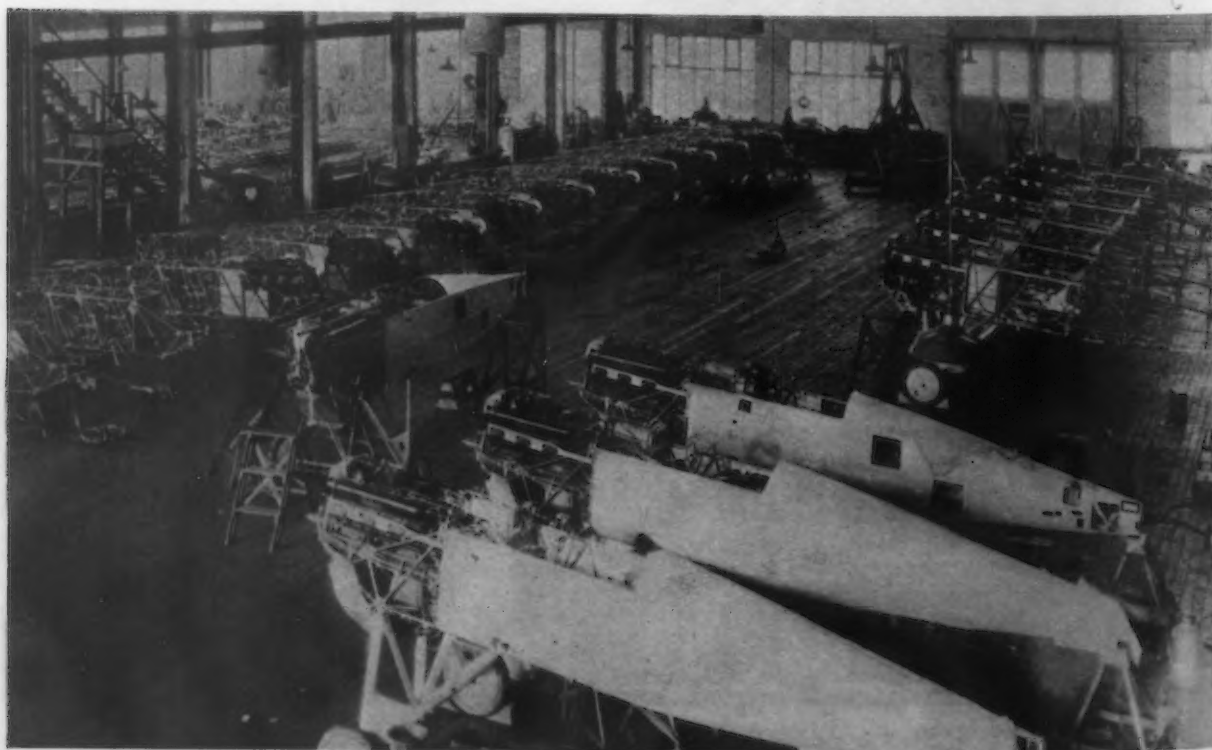
Steel tubing, in the construction of aircraft, was first used during the World War. It was first applied to a limited extent in parts of the fuselage. It has since replaced a large number of the structural parts, until it has quite generally replaced wood in the construction of the fuselage, stabilizer, rudder and elevators.

Three grades of steel tubing are now being used—low-carbon, medium-carbon and alloy-steel tubing. All of these tubes are seamless, as a seamless tube will give more uniform results than a welded tube.

Welded low-carbon steel tubing may be used in parts not subject to stress, such as fillers, bushings and spacers. Low-carbon steel tubing is used extensively in other industries and, therefore, is easy to obtain and low in cost compared with the other grades. It is not uniform, however, and should be thoroughly tested for uniformity before being used in aircraft structures with a high stress.

Medium-carbon seamless tubes are more uniform and have higher yield points, but the operation of welding is not so satisfactory. The welds have a tendency to be brittle.

The alloy-steel tubing which has been developed for aircraft work is a chrome-molybdenum seamless tubing containing from 0.025 to 0.035 per cent carbon. It is easily welded to the chrome-vanadium steel parts which are used for fittings, and the parts and assembly can



*Airplanes Being Assembled at Plant of Boeing Airplane Co., Seattle, Wash.*





**WILLIAM P. MacCRACKEN, JR.**, the first Assistant Secretary of Commerce for Aeronautics, was born in Chicago thirty-eight years ago, and was graduated from the University of Chicago, with academic and law degrees, in 1911. He served during the World War, from July, 1917, to January, 1919, in the Army Air Service. After leaving the Air Service, he returned to the practice of law. He is secretary of the American Bar Association and for many years had been chairman of its Committee of the Law for Aeronautics. In that capacity he devoted a great deal of time to the subject of civil air law and took an important part in the preparation of the Air Commerce Act, and at one time was a governor of the National Aeronautic Association.

Mr. MacCracken has given careful study in the United States and abroad to civil aeronautics. He participated in the world survey made by the Joint Committee of the Department of Commerce and the American Engineering Council. He was chairman of the Aviation Committee of the American Legion for the Department of Illinois, of the Aviation Committee of the Hamilton Club, Chicago, and a member of the Chicago Aero Commission.

Photograph from World Wide Photos, Washington Bureau.

be treated as one piece, since the temperature from which these steels are quenched in the heat-treating operation is practically the same.

#### Wire

The principal wire products used in airplane construction comprise hard wire, stranded cable and streamline wire. The hard wire is used for drift wires and stays, which are tension members only. The steel wire cable used for aircraft represents the highest development of the wire manufacturers' art. The wire cable, non-flexible, acts like a bundle of hard wire members and has properties under tension similar to a solid bar, with the added advantage of multiple construction in case of severe vibration. The flexible and extra flexible cables are used for control wires where bending strains make flexibility necessary.

The size of cables is limited by the methods of manufacture. Therefore, when streamline wires were developed, the breaking strength of the cable was taken as standard and a streamline or elliptical wire was developed which would have corresponding strength. It is used mostly for flying and landing wires, as it will cut down the parasite resistance and enable the aircraft to increase its speed and is easier of application in aircraft construction.

Hard wire used for drift wires and stays is a high-carbon steel which has been coated by a hot tinning process.

#### Engine Parts

The first aircraft engines were all made of cast iron and steel. It was not until after the start of the World War, in 1914, that great advances were made in the development of aircraft engines and the cutting down of weight and increasing the horsepower by applying materials of less weight for certain parts of the engine, such as pistons, connecting rods, crankcases and, in some cases, cylinders. However, the substitution of lighter material for cylinders was never found practical and is still in the course of development.

Satisfactory materials have been developed for pistons, connecting rods and crankcases which save considerable weight on an engine, but gears, crankshafts and cylinders are still made of steel or cast iron.

#### Propellers

In the development of metals to be used in aircraft construction, the metal propeller, which is a very recent development, should not be overlooked. A satisfactory steel propeller has been developed that by many is considered more efficient than the wooden

propeller. It has been found by comparative tests to increase the rate of climb and the high speed of an airplane considerably. It also overcomes some of the difficulties now experienced with wooden propellers in flying through rain, snow or sleet. These weather elements will chip and split wooden propellers, but will not impair the efficiency of metal propellers, which would be quite an item in the operation of commercial air lines.

#### Correlated Uses

Aircraft, to operate successfully, must have adequate airports, lighted airways, radio aids to navigation and mooring masts for lighter-than-air craft. It has even been suggested that floating structures built of steel could be anchored at intervals across the Atlantic.

Every improved means of transportation has created new markets for ferrous metals. Aircraft is the newest and speediest means of transportation available to mankind. There is every reason to believe that peace-time requirements for aircraft will far exceed the military demands, and will furnish a valuable market for ferrous metals.

**RECOGNIZING** the growing importance of commercial aeronautics and the vast possibilities that lie before it, Congress for the first time provided for this service in the Air Commerce law, enacted May 20, 1926. Mr. MacCracken took the oath of office on Aug. 10 of that year.

A new division of navigational aids was established in the Bureau of Lighthouses, Department of Commerce, which is charged with the establishment of intermediate landing fields, and of lighting of airways, etc. A division also was created in the Coast and Geodetic Survey for mapping air routes and another was set up in the Bureau of Standards for research and development work. Investigation is being made in connection with development of the radio beacon, radiophone, radio direction finder and related aids for air traffic, the bureau having the cooperation of the Guggenheim Foundation, the Army and Navy Air Services and other governmental agencies. Another division, in the Secretary's office, concerns inspection of airplanes, licensing of pilots and enforcement of the air traffic rules, while still another division has been created to provide information looking to the promotion of civil aeronautics generally.

# Rustless Iron by a New Process

Novel Method of Melting Developed in Sweden—Electrodes of Ferrochromium Suggested—Chromium Losses Claimed Reduced—Carbon Increases Kept Down

THE melting method described in this article was developed at the smelting works of Aktiebolaget Ferrolegeringar, Trollhättan, Sweden, during the years 1922 and 1923. The narrative of its discovery is as follows:

During 1918 to 1921 experiments were made with a view to finding a method of producing a practically carbon-free ferrochrome at a cheaper cost than hitherto. The impulse was the fact that rustless steel, discovered during the war, had begun to assume importance. For various reasons it was considered that the low-carbon grade stainless iron would assume exceptional importance if it could be produced at a sufficiently low price, and especially if it were possible to produce a practically carbon-free material, 0.03 to 0.04 per cent carbon.

In order to prove this theory it was decided to make trials at Aktiebolaget Ferrolegeringar's works to produce exceptionally carbon-free stainless iron. For this purpose one of the existing melting furnaces was rebuilt into a basic steel furnace of the Girod type with one adjustable electrode. It was intended in this furnace to produce an iron bath having the lowest possible carbon content, to which a suitable quantity of molten ferrochrome of lowest possible carbon content would afterward be added direct from the furnace in which it had been produced.

One of the illustrations shows that if the carbon content of the chrome-free iron bath is 0.025 per cent, and the carbon content of the ferrochrome required for obtaining 13 per cent chrome is 0.08 per cent, the carbon content of the product would be 0.034 per cent, provided, of course, that the ferrochrome could be introduced into the bath without any carbon from other sources entering the bath.

## Other Processes Investigated

Before commencing the experiments thus planned, it was desired to investigate the working of the method employed up to that time in England—direct melting into the carbonless bath of lumpy carbon-free ferrochrome. The first charges were therefore made by this method. It was ascertained that this process always resulted in a higher carbon content in the product than that estimated on the basis of the carbon contents in the ingredients. The increase amounted on an average to 0.03 per cent carbon; thus, if the estimated carbon was 0.04 per cent, the actual carbon in the product was 0.07 per cent, and so on. Further, it was found that the melting in of lumpy ferrochrome was rather troublesome, the consumption of energy being rather high and the strain on the furnace lining, especially the roof, being very great.

The suggestion was then made that these drawbacks might be eliminated (the method originally devised being of course unsuitable otherwise than in connection with the manufacture of low-carbon ferrochrome) by first preparing the soft iron-bath in the usual manner and then exchanging the carbon (graphite) electrode of the steel furnace for a ferrochrome electrode and, by gradually melting this off, bringing the chrome content of the bath up to the desired point.

This method would, of course, entail a greater consumption of current than the method originally planned, but on the other hand it would be possible by this means to know the composition of the ferro-

chrome infused into the bath, which would not be the case if directly produced molten ferrochrome were used.

## Ferrochromium Electrodes Tried

For this purpose ferrochrome electrodes were procured of the same diameter as the graphite electrodes used in the steel furnace, and some trials were made with this method. The result was, particularly in one respect, a disappointment, as it was found that

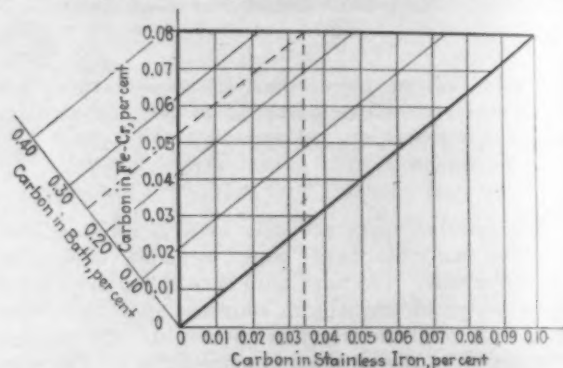


Chart to Show Amount of Carbon Obtained in the Iron from the Alloy

a considerable portion of the infused ferrochrome became oxidized, resulting in a reduced chrome recovery as well as a poor quality of the product.

The simplest way to avoid the oxidization of the ferrochrome seemed to be to keep the point of the ferrochrome electrode, during the infusion, standing in the slag bath which lies above the steel bath. It was, however, to be expected that in such case one could not work with the same high tension between electrode and bath as before. In order to maintain the load with a lower tension, it would therefore be necessary to increase the strength of the current to a corresponding degree. The electrical conducting capacity of the ferrochrome electrode being considerably greater than that of the graphite electrode, and as the transformer used fortunately allowed the utilization of the full effect at such a low tension as 35 volts, there were no technical obstacles in the way of a realization of the last named modification.

Attempts were thus made to work in the following manner: The chrome-free, soft iron bath was first prepared in the usual way. The graphite electrode was then exchanged for a ferrochrome electrode, and at the same time the transformer was recoupled to 40 volts secondary. The current was turned on and the point of the ferrochrome electrode was lowered far enough into the slag bath to obtain the normal furnace load. The ferrochrome electrode began slowly to melt off and had to be lowered gradually in order to maintain the load. A suitable quantity of ferrochrome having been melted off the electrode, the current was turned off and the contents of the furnace were turned into ingots.

Technically the melting by this method proceeded splendidly, the composition of the product was the calculated one and the strain on the furnace roof was completely eliminated.

## Energy Consumption High

One circumstance, however, at first seemed rather puzzling. The consumption of energy for the infusion of the ferrochrome was as high per unit of weight as

This article is contributed by the Aktiebolaget Ferrolegeringar, Stockholm, Sweden, represented in the United States by Charles Hardy, Inc., 100 East Forty-second Street, New York.



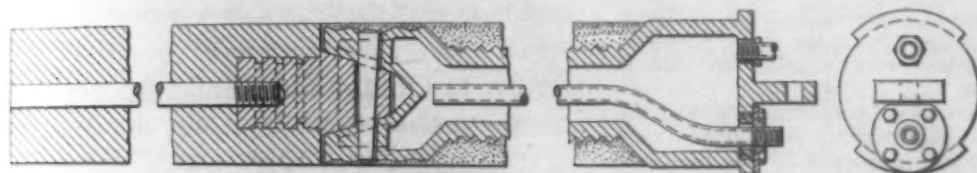
when cold ferrochrome was infused by means of the graphite electrode, in spite of the fact that the temperature in the furnace space above the bath was very low, and, therefore, the loss of heat in the furnace should have been appreciably lessened and its thermic effectivity correspondingly increased.

The explanation of this anomaly was, however, soon discovered—that the temperature of the steel bath had increased considerably. Consequently the next step was to try to utilize the excess heat, which was done by charging cold lumpy ferrochrome into the bath simultaneously with the melting off of the ferrochrome electrode. In this way it was found possible to obtain a suitable temperature of the bath if  $\frac{2}{3}$  kg. of cold

nance was available which would lend itself to such alteration, it was decided to make the first trials in a provisional construction without roof. It was then found that the melting in such an open furnace under certain conditions was more successful than in a covered furnace inasmuch as it was possible, provided one did not work with too low a load, for every part of the ferrochrome electrode to infuse more than two parts of cold lumpy ferrochrome.

The new melting process was thus in principle completed. The practice which we have found most suitable to use is as follows:

As a melting furnace, a "tipable" ladle is used, provided with a handle, of the shape indicated by one



General Scheme  
for the Ferro-  
chromium Elec-  
trode

lumpy ferrochrome were charged for every kilogram infused from the electrode.

By the last described method the problems which had arisen were, from a technical point of view, solved. The extra absorption of carbon into the bath during the infusion of ferrochrome could be avoided, and the consumption of energy had been reduced to a minimum.

However, one problem still remained: The ferrochrome electrodes as such could only be partly utilized. It was certainly not entirely out of the question to prepare them in such a way that they could be joined together like graphite electrodes, but this could not be successfully accomplished with the comparatively simple machinery which was available at the works in spite of the fairly soft character of the carbon-free ferrochrome.

Instead an attempt was made to construct a holder by which the electrode could be lowered so far into the furnace that it would be possible to melt off practically the whole of it. One illustration shows how this problem was solved. The arrangement functioned in the main satisfactorily, but once or twice cracks occurred across the ferrochrome electrode which caused the iron bar, around which the electrode had been cast, to carry the whole of the current, with the result that it fused off and the lower portion of the electrode fell into the bath. If this happened at the beginning of the ferrochrome infusion, it did not matter very much; it would only be necessary to charge a correspondingly smaller quantity of lumpy ferrochrome, but a break close to the top of the electrode toward the finish of the charge caused greater difficulties.

Although there is little doubt that it would have been possible to produce ferrochrome electrodes provided with a core of iron which were fully reliable in this respect, this work was not carried out, for reasons which will appear from the following:

The production of rustless iron on the lines indicated by the trials described above would necessitate the construction of new furnaces, especially if production on a large scale were intended, as, for a rational employment of the process, one would naturally require, first, furnace transformers constructed and dimensioned quite differently from those hitherto in use, and, second, specially constructed arrangements to make possible a quick exchange from graphite electrode to ferrochrome electrode.

#### Melting Ferrochromium Separately

It was then suggested that it would be more convenient to perform the production of the soft iron bath in an ordinary steel furnace of any suitable type and to melt the ferrochrome in a separate electric furnace.

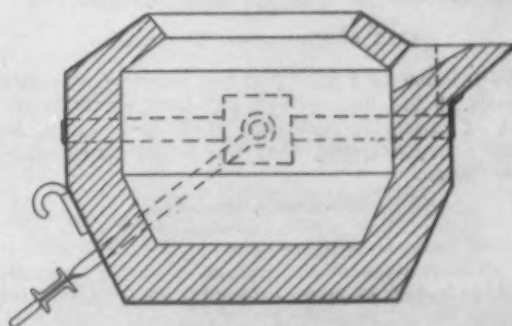
The type of furnace that first came to mind for the last named purpose (the melting of ferrochrome) was a 3-phase furnace of similar type to the ordinary steel furnaces in which the distance between roof and bath had been reduced to a minimum. As, however, no fur-

of the illustrations. The electrical equipment consists of a 3-phase transformer which secondarily can give off the desired effect at a tension of about 40 volts (between each electrode and the bath in the ladle). The tension difference between two tappings of the transformer is therefore suitably about 70 volts (Y connection). The three ferrochrome electrodes are suspended free so that the ladle may be placed underneath them, and they are raised and lowered by mechanical arrangements.

#### Details of the Melting Operation

The melting operation itself is as follows:

The ladle, which has a basic lining and need not even be pre-heated, is placed in position. On the bottom of the ladle are placed three small heaps of iron turnings, or other finely disintegrated suitable metal, one heap under each electrode. In order to obtain good electric conductivity between the three heaps of turnings, pieces of iron scrap or ferrochrome are laid between them. A quantity of quartz-lime mixture (1 part quartz to 3 parts burnt lime, both fairly fine-



Special Ladle Used in Melting the Ferro-  
chromium

grained) is prepared. The current is turned on to the electrodes and these are lowered until they come into contact with the iron turnings, when arcs are formed between the electrodes and the heaps. A few shovelfull of the quartz-lime mixture are poured over the burning arc-lights, but care must be taken that these are not extinguished. The quartz-lime mixture then begins to melt and a fresh quantity is charged immediately.

If the correct practice is followed, it should only take 10 to 12 min. to produce a slag-bath in the ladle in which bath the points of the three electrodes stand immersed. They should be kept sufficiently deep to obtain a density of current of 28 to 35 amp. per sq. cm. of the electrode area. As soon as the furnace is running smoothly, lumpy ferrochrome is charged successively, and, provided the correct practice is followed, the quantity of cold ferrochrome that can be charged may be up to 2.3 times the amount of ferrochrome melted off the electrodes. When the desired quantity of ferrochrome has been infused, the electrodes are hoisted up. The ladle is lifted away and the contents poured out where desired, e.g. into a steel furnace where a low-carbon iron bath has been prepared. By suitable arrangements the slag can be retained in the

ladle while the melted alloy is poured out. The ladle is then immediately ready for the melting of a fresh quantity of ferrochrome, thus avoiding the trouble of preparing a new slag bath. It is evident that, if from the beginning one has a suitable molten slag available, free from iron oxides, the cost of commencing the melting with the preparation of a slag bath may be saved.

The following table shows the relation of electrode section, load and melting capacity:

Electrode Area Dia. in Mm.	Load, Kw. per Electrode	Amperage per Electrode	Quantity of FeCr Melted per Hr. in Kg.		
			From Electrode	Cold Metal	Total Metal
75	67	1500	25	55	80
100	110	2500	42	90	132
125	170	3800	64	143	207
150	235	5300	90	200	290
175	320	7200	120	280	400
200	400	9000	150	350	500

From the above table it may be calculated that, if it is desired to obtain, say, 400 kg. molten FeCr per hr., one will use 3 electrodes of 100 mm dia. and the transformer should be dimensioned for 330 kw. (400 kva). Thus 42 kg. FeCr is melted off the electrode per hour (specific weight 6.8), which means that about 80 cm. will be melted off per hour. As that portion of the electrode which cannot be utilized as such is about 3 d m. one should, if melting goes on interruptedly for 2 hr., use electrodes of 190 to 200 cm. in length. From the table it may also be deduced that the consumption of energy will be 0.835 kwhr. per kg. of molten metal. In these figures is included the energy required to produce the initial slag bath.

The figures given in the table are the result of experience from furnaces with three electrodes, but should, on the whole, apply also to calculations for other numbers of electrodes. It should, however, be borne in mind that the thermic effectivity is determined by the total load on the furnace. If the total load is appreciably below 200 kw., the effectivity decreases quickly.

Instead of using electrodes of ferrochrome, there is no objection to the use of iron electrodes. The advantage of the latter is that they can be used of greater length. Trials have been made with such electrodes 6 m. long. It is evident, however, that these must be of first quality if it is desired to avoid contamination of the ferrochrome.

#### Cost of Chromium Electrodes

As the cost of 1 kg. Cr in the shape of an electrode is about 10 öre higher than the same quantity in the shape of lumpy ferrochrome, it is easily seen, based on the above example, that the following calculations can be made:

A. Infusion by ferrochrome electrodes	
2 m. long, with a supposed Cr.	
content of 65 per cent.	
Consumption:	
70 kg. Cr. (107 kg. alloy) ÷ (x ÷ 10) öre = 700 ÷ 70 x öre	
112 kg. Cr. (180 kg. alloy) ÷ x öre = 112 x öre	
Total	700 ÷ 182 x öre
Deduct:	
15 kg. Cr. (23 kg. alloy) in the shape of	
unused electrode ends.....	15 x öre
Cr. cost of 167 kg. Cr. ....	167 x ÷ 70 öre
B. Infusion by iron electrode:	
167 kg. Cr. (257 kg. alloy) infused	
with 130 kg. iron electrode	
(supposed 6 m. long).	

With equal economy the iron electrode may thus cost Kr. 55 per ton more than the material used in producing the soft iron bath.

From the above it may be seen that the problem which is claimed as solved by the method here described is:

A melting method has been evolved by which carbon-free ferrochrome can be brought into molten state with low consumption of energy, without any noticeable loss of chrome and without increase of carbon or any other contamination.

The only previously known furnace in which this has been possible is the electric induction furnace. If the building costs of such a furnace and the necessary electric equipment are compared with the costs of the plant here suggested, of the same capacity, it will be

found that these stand in the relationship of 10 to 1, and, under certain circumstances, even 20 to 1.

However, the possibilities of this melting method are not exhausted by what has been stated above. Every producer of rustless steel and iron knows that to use the scrap resulting in the course of manufacture means a considerable loss of chromium and, in certain cases, an undesirable absorption of carbon. By melting such scrap in the manner here described, it can be converted without any alteration of its composition into ingot metal of commercial use.

This melting method has also been tried on a small scale in other spheres of metallurgy with, in certain cases, promising results. However, as the present notes have been intended mainly to draw attention to its utility for producing rustless iron, there is perhaps no need to go more closely into these subjects.

#### How to Obtain and Retain Apprentices

"The problem is much in parallel with that of the sportsman, especially the angler and the hunter," said W. Armstrong, director of training, Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., in discussing "How to Obtain and Retain Boys for Foundry Apprenticeship." His remarks on this subject, as quoted in a recent bulletin of the National Founders' Association, are in part as follows:

A skilled fisherman knows that he must adapt his bait to the fish, the water, and the locality. He must have skill in the use of his tackle, and an intimate knowledge of the habits and peculiarities of his fish. He further knows that after "hooking" he may lose his catch by mishandling. Suitable equipment is necessary to the man who sets out to fish or to hunt. He selects with care knowing that bad judgment may lead to disaster, or at least to disappointment, and he has got to play the game. "Bagging" boys for apprentices requires the same skill, patience and well laid plans. The bee is attracted by the flower because the flower offers an inducement to the bee—a return for labor.

These homely similes suggest to me the basic principles and methods to be employed in securing boys for apprentices . . . We must start out with the conviction that we have to educate the parents in the value of a trade so that they may grasp the benefit to the boy, the industry and the nation; and they need to be told how to proceed in putting the boy to a trade. We must also be prepared to consider that the boy has no notion of what he wants to do; we have to get him thinking what he can do and where he should do it.

We have a dual purpose in our initial stages of the game—to educate both the parents and the boy in the advantages derived from learning a trade. We have to get them to consider that trades are worth-while occupations for any class, and that artisans are the backbone of industry and on industry the prosperity of the nation depends.

The Audit Bureau of Circulations, which is the organization through which worthwhile publications report to the advertising world regarding the size and distribution of their circulations and their methods of winning and holding subscribers, is moving its headquarters in Chicago to the Builders Building, Wacker Drive and LaSalle Street. In addition to the publisher members, of which THE IRON AGE is one, the bureau has in its membership important national advertisers and advertising agencies. Its managing director is O. C. Harn, for 21 years advertising manager of the National Lead Co.

What is called the Machine Age Exposition will open Saturday, April 30, at the Scientific American Building, 24 West Fortieth Street, New York. Exhibits will cover the field of art, engineering and industry as they are related to one another. The exposition, which will hold forth for two weeks, is expected to act as a forerunner for a permanent exposition, such as the industrial art museums in foreign cities. Exhibitors will not purchase space but be invited to participate.



# Belgium and Luxemburg Face Test

Fall in Franc Helped Steel Exports—Industries an Extension of French Lorraine—Great Britain Buys Crude Steel—United States Buying Rails and Shapes

BY PAUL M. TYLER\*

**B**ELGIUM is the neck of the funnel that leads from the Lorraine ore fields. French pig iron and steel exports are poured out to overseas markets mainly through Antwerp. French ore and pig iron, worked up into Belgian steel, pass through the same port. Luxemburg (which was split in two in 1839, one-half being incorporated as a Belgian province, and the other half retaining its independence as a Grand Duchy), after being a member of the German Customs Union from 1842 until after the Great War, voluntarily merged itself economically with Belgium on May 1, 1922. Its products, also, are now exported through Belgian territory.

Both countries are small. But, though their combined area is a trifle less than that of the State of Maryland, each supports a relatively large steel industry and a disproportionately great export trade, both in steel and in its manufactures. Luxemburg owes its entire industrial existence to the narrow strip of iron ore along the Lorraine border, where nearly half the population is occupied in producing iron and steel—mainly for export.

Belgium, on the other hand, has diversified manufacturing industries, and exports not only steel, machinery and hardware, but also a great variety of other goods, including textiles, glass, cement, and sundry heavy ceramic and non-ferrous metal products. Notwithstanding its intensive manufacturing activities, and although it is the most crowded country in Europe, it is also the market garden for other industrial regions nearby. Agriculture is still the foremost Belgian industry. Throughout the country, although more particularly in the southern section, a large part of the people live on small farms, the men being employed in mines or factories while the women bear the brunt of the work in the fields.

## Belgium Must Import Ore and Coal

**L**UXEMBURG, although it could probably again produce more ore than it consumes, has no coal. Belgium produces a great deal of coal, but not enough for its own tremendous needs, and it is absolutely dependent upon import for its ore supply. An ancient industry was based upon local ores, but now the only important remaining ore resources are in the valley of the Meuse and the ore bodies, being water-logged, are hazardous to mine, while the ore itself, an oolitic red hematite, is classed as refractory.

Ninety per cent of the ore used is minette, 75 per cent of the total consumption being derived from Lorraine and about 16 per cent from Luxemburg. Some 7 per cent is Swedish ore and only one or two per cent is domestic. Despite the small production, Belgium has always exported a little ore. Recently, these exports have increased to almost 2,000,000 tons annually, due to the union with Luxemburg, which still exports a little ore to Germany, and sends a considerable tonnage of fluxing ore to France.

In the matter of fuel, Belgium finds it necessary to import about one-fifth of its furnace coke, and from

60 to 65 per cent of the domestic coke is made from imported coal. While the Campine basin in the north is just coming into production, and while there have been important new discoveries in the southern fields, both Belgium and Luxemburg are normally dependent upon Westphalia for a significant fraction of their fuel.

## Focal Situation Impressive

**G**EOGRAPHICALLY, however, Belgium is one of the most favored nations. It forms the main highway for trade between many parts of the interior of Europe and lands overseas, including Great Britain, the United States, South America and the Far East. The navigable rivers are linked up with a fine system of canals which extend throughout the industrial areas. The railroads (which passed into private control on July 1, 1926) have always provided cheap and efficient transportation and they have been supplemented by a network of light railroads similar to the trolley express services operated in parts of New England. Even rural roads are mostly paved so as further to facilitate the movement of merchandise.

These facilities all focus at the port of Antwerp, which has been improved so that, at least for moderately large ships, the cost of loading and unloading is less than it is at any other Continental port. Many products are loaded direct from the canal barges, which can be placed alongside the sea-going ships at the docks.

Moreover, the distances are always short. The ore haul, for example, from Luxemburg to Liège or to Charleroi is only 90 miles, and it is only 150 miles from Briey, the heart of French Lorraine. Before the war the freight for the latter haul varied from 4½ to 5 francs, depending upon the route, an average in American money of possibly 90 cents. Translated into dollars, freights have been consistently lower since the war than before. Even the latest increase of 10 per cent in January, 1927, raises the coefficient so as to increase the tariff to only a trifle more than seven times pre-war, or just about enough to compensate for the reduced value of the franc, the new Belga equivalent to five francs being pegged now at about 13.9c.

## Labor Diligent but Independent

**T**HE people of Belgium—both French and Flemish—are good workers. They are able and willing to endure a remarkable amount of physical toil. Through the course of several generations, they have also become highly skilled, the trade of puddling iron, for example, being handed down from father to son. This has left its mark upon Belgian industry, because it is only since the war that the replacement of wrought iron by steel produced any considerable reduction in the output of puddled iron.

Until 20 or 30 years ago, almost every girl and woman in the coal districts worked in or about the mines—at least up to the time of marriage. The women, since even now they do a great deal of heavy work, add substantially to the available supply of labor. This supply has been reduced, however, by the 8-hr. day, which is rigidly adhered to throughout the coun-

\*1317 Thirty-seventh Street, N. W., Washington.

try. Thus, the railroads and other large employers have had to increase their staffs by 30 per cent, simply for this reason.

There is also a growing complaint that Belgian labor, which has always been independent and intolerant of discipline, has not only reduced its output per day, but also its output per hour. Complaints of this sort must always be discounted, but more significance may attach to the announcement by a Belgian labor union official that the workers "have done away with exaggerated physical effort."

#### Wages and Living Standards Low

IN the past, Belgian industry has employed "exaggerated human effort" to do many things that could be better done by machine. Human labor is never cheap. Despite the prodigious energy of the people, wages have been low, and, while work has been generally plentiful, the standard of living has necessarily been low also. However, there is ordinarily more than one wage-earner to each family, and the total earnings are eked out by the housewife's doing many tasks in the home which, being performed outside, have to be paid for in other countries. Belgian workers, therefore, have nearly always been able to save a little from their meager wages.

Fully 90 per cent of the labor now belongs to unions, and there is a growing dissatisfaction with the wage scale, which has reluctantly followed the cost-of-living index through the inflation period. Strikes have become more frequent and, almost within the year, the steel industry in the Charleroi region was paralyzed by a strike which, beginning in June, 1925, lasted for seven months and which, for a time, threatened also to close the mills in Liège.

#### New Plants for Old

IF there be a tendency for Belgian labor to demand more pay for less work, it is apparently more than offset by the more generous use of machinery and better plant layout. The Germans, since they apparently looked upon Belgium as a dangerous competitor, deliberately demolished most of the iron and steel works during the occupation. The actual result, however, was the exact opposite of the intention because, as in France under like circumstances, up-to-date, efficient works promptly took the place of old-fashioned ones. In many cases, since even the foundations of the old buildings and equipment were blown up, it was possible to make a completely new lay-out instead of being hampered by the many compromises incident to remodeling or extending an old plant.

In Luxemburg, which suffered little physical damage during the war, a great deal of new plant has also been put up. Returning late in 1926 from a tour of the principal works, a party of British steel men were all warm in their praise of the efficiency displayed. They remarked especially upon the meticulous economy of both fuel and labor.

#### Production Increased Rapidly

IN 1926, both Belgium and Luxemburg were producing at a record-breaking rate. In Belgium, the monthly pig iron output increased from 203,800 gross tons in 1913 to 313,400 tons in August, 1926. In Luxemburg, while pig iron production was almost exactly the same in 1926 as it was in 1913, steel output increased from 109,000 gross tons monthly in 1913 to a high point of 192,700 tons in 1926 (March). Steel production in Belgium increased in almost exact proportion with that of pig iron, from 202,300 gross tons per month in 1913 to a peak of 312,900 tons in August, 1926.

The strong competitive position of the two countries is indicated by the reluctance of Belgian makers to come into the Continental Steel Cartel and by the fact that, when they did join, they made a relatively good

bargain. However, their normal quota of 295,000 tons monthly, although it is 50 per cent in excess of the monthly average in 1913, is still less than the output for several months in 1926. Luxemburg is given a quota of 205,000 tons (on the basis of 30,000,000 tons annually for all members) or nearly double its average steel output in 1913, but has never yet quite reached this figure and cannot do so until new construction, now under way, is completed.

#### Improved Pig Iron Supply

FOREIGN trade figures show the improvement in the position as regards pig iron. Belgium has never made enough pig iron for local needs, importing 600,000 tons before the war as compared with an output of 2,445,000 gross tons in 1913. While the output doubled between 1904 and 1913, and has increased almost 50 per cent more since 1913, steel production has increased

#### Imports and Exports of Belgium, 1913, 1923, 1925 and 1926

(Including Luxemburg, except in 1913)  
(In Thousands of Metric Tons)

Commodity	Monthly Averages							
	1913		1923		1925		September, 1926	
	Im-ports	Ex-ports	Im-ports	Ex-ports	Im-ports	Ex-ports	Im-ports	Ex-ports
Pig iron .....	48.3	1.4	27.5	6.8	27.1	8.1	34.2	10.3
Billets, bars, etc. ....	6.8	13.2	8.1	36.1	5.5	69.5	9.2	77.8
Sheet bars, etc. ....	4.1	54.1	1.6	94.1	(a)	97.0	(a)	98.4
Shapes .....	0.1	8.0	0.1	16.5	1.2	23.6	1.0	34.7
Plates and sheets .....	2.0	16.4	1.2	16.7	0.9	21.8	2.1	23.2
Tin plate .....	1.1	0.3	1.3	0.0	1.3	(b)	1.2	(b)
Galvanized sheets .....	0.1	0.5	0.1	0.1	(c)	1.1	(c)	1.1
Rails .....	0.7	13.7	0.1	17.0	0.5	14.2	0.4	17.0
Wire and wire rods .....	5.7	5.6	1.8	7.0	2.9	11.0	4.8	15.2
Pipes and tubes .....	1.8	0.5	0.9	1.1	0.9	1.7	0.8	2.0
Castings .....	0.8	2.2	0.0	2.0	0.5	2.3	0.5	4.0
Forgings .....	1.6	11.6	1.3	8.0	(d)	(d)	(d)	(d)
Nails, bolts, etc. ....	(d)	3.7	(d)	5.7	0.4	7.8	0.5	10.4
Other items ..	0.9	0.1	0.4	0.1	3.0	5.6	4.3	16.6
Totals ...	74.0	131.3	44.4	211.2	44.2	263.7	59.0	310.7

(a) Included with billets, bars, etc. (b) Included with galvanized sheets. (c) Included with tin plate. (d) Included with other items.

virtually in proportion. Foundry consumption has likewise increased, being 20 per cent more in 1926 than in 1913.

While special grades of iron are now produced at the Cockerill works (near Liège), most Belgian iron and almost all that produced in Luxemburg is Thomas quality, and hence both low and moderately low-phosphorus iron must be imported, usually from England and Sweden. The reduction in net imports of pig iron from 47,000 tons monthly in 1913 to only 20,000 tons monthly in 1926 is only partly explained by the union with Luxemburg, whose surplus, formerly large, has been reduced, as its steel capacity has caught up with its pig iron capacity.

Other factors are the reduced output of wrought iron and the larger use of scrap. The latter world-wide tendency, however, is restricted in Belgium and Luxemburg, because so little scrap can be used in making Thomas steel, which forms 90 per cent of the output. For this reason, there is regularly a large surplus of scrap for export to Germany, Italy, Great Britain and nearby France, although the proportion of mill scrap to ingot output is smaller in Belgium than it is in England, for example, where less of the steel is marketed in semi-finished form. Scrap is imported into Belgium and Luxemburg, also, some of it being light scrap which is charged into the blast furnaces. In 1925, 8½ per cent of Belgian pig iron was derived from scrap.

#### Exports Much Semi-Finished Steel

LIKE France, Belgium is an exporter of semi-finished steel and, due to the union with Luxemburg, the exports in this class (chiefly to Great Britain) have



been well maintained. Recent trends are confused, however, on the one hand by the Charleroi strike in 1925, which was followed by the severe floods in January, 1926, in the valleys of the Meuse and the Sambre and, on the other hand, by the British coal strike, which provided an abnormal demand for raw products.

The chief advances have been made in the exports of heavy steel—rails, shapes, heavy plates and wire rods. Improvement is noted, also, in the exports of wire products, including barbed wire, and a great and growing business in nails. Exports of "iron bars," which probably include much steel, amounting to close to 100,000 tons monthly in 1925 and 1926, have been included with semi-finished steel in the accompanying table.

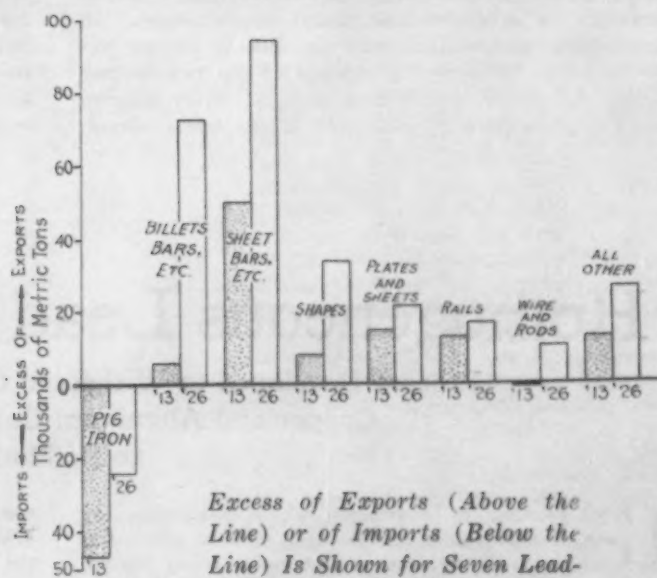
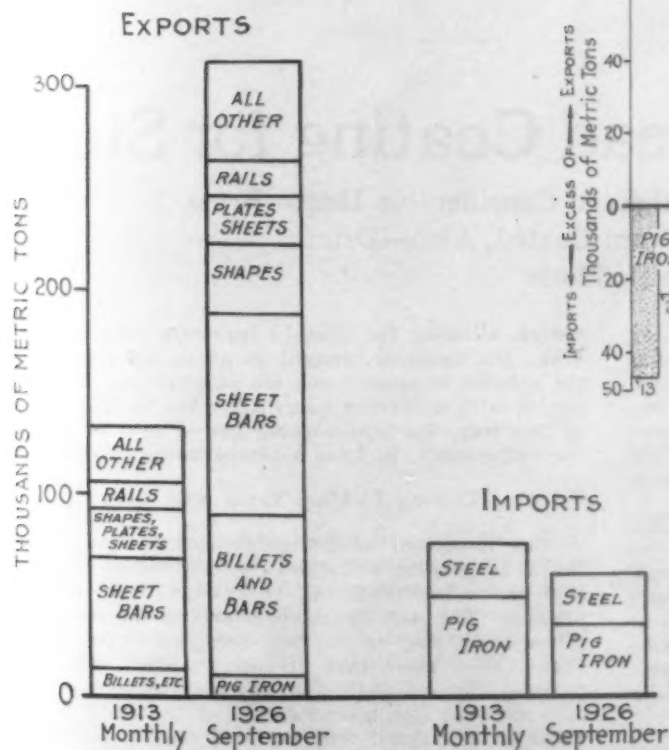
The United States has become one of the leading markets for Belgian rails and has been buying more and more structural material—especially along the Pacific Coast, where the original disparity of \$12 or

items." This classification covers both crude products, such as die blocks or other rough forgings, and highly finished goods, including wire products. About 7000 workers are employed in the wire mills and factories, the output of wire—about 25,000 tons monthly—being worked up into a great variety of specialties as well as into nails, fencing, etc. Hobnails, and sundry special tacks and nails, shoe rivets, shoe plates, and similar odds and ends are all made in the same factories and in considerable quantities.

#### Belgium Must Export

IN proportion to its population, Belgium has a large home market for steel, but even domestic sales are dependent mainly upon foreign markets. Some 4000 persons are employed in locomotive shops, and other thousands are occupied in the great structural shops and bridge works, and in the factories for making hoists, cranes, pumps, railroad material and other

Below Is Shown the Main Composition of Exports and of Imports in 1913 and in 1926. Exports have more than doubled, but imports have declined



Excess of Exports (Above the Line) or of Imports (Below the Line) Is Shown for Seven Leading Products Above. In every case the outgoing movement has profited since 1913 at the expense of the incoming. In pig iron the net imports have decreased; in wire and rods net imports have changed to net exports; in the others, net exports have increased

even \$18 per ton between Belgian and American mill prices is further exaggerated by the cheaper freight from Antwerp. But Belgium has always found a world market for her goods. The above products, for example, are sold extensively also in the Far East and in South America. For cheap plates and sheets, the principal markets are the United Kingdom and British India. Tin plate, on the other hand, is imported, mainly from South Wales. The imports of rails and shapes are from France and to a smaller extent from Germany.

The consistent increase in the net exports of pipes and tubes deserves notice. While the exports are divided fairly equally between cast and wrought pipes and fittings, the imports consist principally of wrought pipe.

Owing to the delay in the publication of detailed official statistics, it is not yet possible to analyze the remarkable increase in the exports described as "other

heavy machinery and equipment. But the products—even plumbers' supplies—are mostly for sale abroad. To a greater extent even than the United Kingdom, Belgium lives by trade, carrying on in addition to the export of its own products a vast entrepot trade. (Some of the warehouse business in foreign steel, though classed as "temporary admissions," appears in the imports statistics, as do also items imported in bond for further manufacture.)

Belgian banks have done much to encourage export trade, both by extending export credits and by fostering foreign investments. Since the Congo, which is the one colony, has not progressed sufficiently to provide a great market, Belgian capital has been used to finance railroads and other undertakings all over the world. Great sums were lost in Russia, but, since the risk was well distributed among many different countries and kinds of business, these ventures have not only greatly

enlarged the demand for Belgian goods, but also have proved generally profitable in themselves.

The Government likewise has been a powerful agent in extending foreign trade. In addition to the usual statistical and informational services, it takes an active interest in other ways and even guarantees export credits. Last year, the Act of Aug. 7, 1921, authorizing these guarantees up to a maximum of 250,000,000 francs, was prolonged until 1931. Government intervention was the principal means of bringing Belgium into the Continental Steel Cartel, and this should develop a closer union among manufacturers in different districts.

#### Cooperation Helps Trade

**B**OTH in Charleroi and in Liège, but particularly in Liège, the steel firms have cooperated fairly closely, and in some instances have actually built and operated factories and sundry special productive facilities on joint account. Until recently, however, this spirit of cooperation was largely local and not national in scope. Henceforth the two principal districts are likely to be drawn closer together because of their common interests in several international organizations. In Luxemburg, the steel industry has already become virtually a unit through the alliance of the two leading firms, the Arbed and Terres Rouges, which alliance controls more than three-fourths of the whole output.

Belgium has a greater productive and export capacity today than ever before. Its position has been strengthened by the union with Luxemburg, by the addition of the districts of Eupen and Malmédy (acquired from Germany), and by the development of its African possessions. It enjoys a tremendous transit trade in French products, and a considerable trade of this sort in German goods. To the extent of its meager fuel supplies, it is in a decidedly favorable position—literally—for working up Lorraine ore on its way to England and to overseas markets generally.

#### Export Struggle Impends

**B**EFORE the war, Belgium, more or less single-handed, succeeded in winning among steel-exporting nations a place scarcely inferior to that of Germany or Great Britain. Henceforth, the fortunes of Belgium are merged with those of both France and Luxemburg.

All three of these countries, which may be expected to act very much as a unit, have been aided by the artificial stimulation of inflated currencies and, later, by the paralysis of British industry during the coal strike. But the field is now cleared for a fair test of strength among the Franco-Belgian-Luxemburg group, Germany and Great Britain. This triangular struggle should be well advanced before the end of the present year.

## Homogeneous Lead Coating for Steel

Process Developed to Withstand Considerable Heat—Brass, Copper and Aluminum Coated, Also—Drums to Be Made

**L**EAD coating by a process which eliminates the use of soft solder or tin, as a flux to effect the adhesion of the lead to the metal being coated, has been developed by the Gross Lead Burning & Coating Corporation, 3955 West Twenty-fifth Street, Cleveland. This is being used commercially for applying coatings of lead to steel, brass and copper containers for holding corrosive acids.

In place of the usual solder flux, a liquid lead flux is used, made from a formula developed by Louis Gross, president of the company, after 20 years of research and experimental work while plying his trade as a lead burner in chemical plants and ammunition factories in Europe. The success of the Gross formula is attributed to the avoidance in the flux of tin or other materials readily attacked by acids or which prevent the coating from withstanding heat.

#### How the Operation Proceeds

Pieces to be lead-coated, which are small enough to be dipped in a tank, are first cleaned by pickling in diluted sulphuric acid and then rinsed in clear water. They are then immersed in a pure lead bath. The flux floats on the top of the molten lead, to a depth of from  $\frac{1}{2}$  in. to 2 in., depending upon the character of the work being coated. As the piece is dipped into the bath it is completely covered with the flux, which opens the pores of the metallic surface. The piece is left in the bath a few minutes, until a skin base about the thickness of writing paper is formed. Upon this amalgamated basis successive coatings of lead are built up with the ordinary lead burning process, by means of a burning bar and oxy-hydrogen torch. When finished, a homogeneous coating is provided of  $\frac{1}{8}$  in. to  $\frac{3}{16}$  in. in thickness, according to requirements.

Articles too large to be immersed in lead baths for skin coating are first cleaned with emery wheels or by sand blasting. The piece is then preheated with a torch, a small section at a time. If its form permits, the heat is applied to the side opposite that being

coated, allowing the heat to penetrate clear through. When the metal is brought to about 700 deg. Fahr., the solution is applied and the skin coating of lead is put on with a burning bar. After the base is applied in this way, the lead burning bar is used for adding successive coats, to form a homogeneous coating.

#### Coating Pickling Tanks with Lead

One important advantage claimed for the process is that the coating will stand the temperature of molten lead before loosening, and, in fact, will melt before it loosens. The melting temperature of the coating is given as 650 deg. to 670 deg. Fahr., or 50 deg. higher than that of sheet lead. Ordinary solder, when used to cause adhesion to the part being coated, it is pointed out, melts at low temperature and the coating gives way. It is claimed that the lead coating applied by the Gross process will not peel, buckle, crack or blister, and that heat expansion and contraction have no effect upon it. Sheets coated by the process, it is stated, can be crimped, beaded or rolled after coating, without damage to the coating.

The process is being applied for coating pickling tanks in the sheet steel industry, to take the place of wood or steel tanks lined with sheets of lead. One problem that developed when pickling tanks are heated to increase the rapidity of pickling has been to find a pipe that would withstand the service of carrying the heating steam into the pickling acid. Lead pipe buckled under the effects of heat. Some sheet mills replaced the lead pipe with brass pipe, but this is said to leave a slight trace of brass on the sheets. This problem has been solved in the Gross plant by the manufacture of reinforced lead pipe. Three steel bars, concave in form, are coated with lead and placed on the outside of the pipe, to give it rigidity. Then a lead coating is applied over the outside of the pipe, cover-

(Concluded on page 1044)



# Fluorspar in Cupola Practice

German Tests Indicate That It Does Not Act as  
Desulphurizer Where Lime Used Is Pure—  
Further Research Needed

IT is generally understood that the use of fluorspar as an addition to limestone in the fluxing of a cupola renders the slag more fluid, and further, that there is a tendency to lower the sulphur content in the iron melted. There have, however, been no systematic tests made to reduce the practice to actual figures. Previous experiments by Wilke-Doerfurt and Bucholz had proved the desulphurizing action of fluorine upon the molten iron, but these were experiments with small crucibles. F. Seiter questions whether the conclusions derived could be applicable to production scale melts in actual cupolas. In *Stahl und Eisen*, No. 4, page 128, there are recorded the results of a series of investigations on the subject from which the following has been abstracted:

## Plan of Experiments as Carried Out

The first series of tests consisted of cupola runs on 13 days, the first four with ordinary limestone, the next three with limestone and normal fluorspar additions, then two days with limestone alone, and the final three days with limestone and varying quantities of fluorspar. The results show that a distinct reduction in sulphur increase could be recorded. To understand this better, the following figures will serve:

The calculated sulphur content of the mixture, as based upon sulphur determinations of the pig irons and scrap used, was 0.152 per cent for the first seven days and 0.134 per cent for the last six. The sulphur content in the castings the first four days and eighth and ninth days—without fluorspar additions—was 0.222 and 0.213 per cent respectively, the figures being averages. The sulphur content for the fifth to seventh day—with normal fluorspar addition—averaged 0.180 per cent, or a reduction of 0.040 per cent in sulphur from what it would have been; and for the final three days of 0.173 per cent sulphur, or a reduction of 0.040 per cent also, the fluorspar additions varying.

## Does the Fluorspar Reduce the Sulphur?

From the above series of tests it would seem that the effect upon sulphur removal in cast iron by fluorine had been proved. However, closer examination of the occurrences during the melts indicated abnormal conditions in the melting progression. This was also shown by the irregularity in the slag compositions, for during the time when the fluorspar was used, the lime content in the slag dropped considerably, indicating that the lime content in the limestone used might be profitably investigated. This was done, and it was found that the local limestone used (Canstatt, Wurtemberg) ran only 85 to 88 per cent in calcium carbonate.

Two further series of tests were then made with special observation of the slag compositions with this poor limestone, and no fluorspar additions. Considerable irregularity in the lime content of the slag was established, and the next series of tests, with a Jurassic limestone running 98 per cent in calcium carbonate, gave quite uniform percentages of lime content in the slags made, with but three-fifths of the quantity of limestone charged and necessary for proper fluxing. Operations of 18 days with this extremely pure limestone gave an average sulphur increase of 0.014 per cent, and, with fluorspar additions for a period of nine days, an increase of 0.015 per cent, or a shade higher. Three days of the nine in question ran up to 0.019 per cent. The inference from this would be that, with very high-grade limestones, an addition of fluorspar for desulphurizing purposes would be useless.

The slag analyses for the test series in question

Abstract and comments made by Dr. Richard Moldenke, Watchung, N. J.

indicated that a cutting action of the fluorspar on the lining has taken place and accounted for a higher silica content. Iron and manganese oxides were constant, whether fluorspar had been used with the limestone or not. Similarly the sulphur content of the slag remained the same.

## Effect of Lime Content of Fluorspar

As it looked very much as if the only effective part of the fluorspar was its content of lime, a series of tests was made to see if this might be so. For 12 days the regular heats were run with the normal fluxes consisting of 44 lb. of the pure limestone and 13.2 lb. fluorspar. Then for three days further the heats were run with fluxes of 26.4 lb. limestone, with 13.2 lb. fluorspar, or two-thirds limestone and one-third fluorspar; then three days more with 26.4 lb. of fluorspar and 13.2 lb. of limestone, or two-thirds fluorspar; finally, three days with 39.6 lb. fluorspar, or no limestone whatever. These figures for fluxes were used for every charge of the respective heats. Based upon the analyses of limestone and fluorspar, the three fluxing proportions in question would give an equal amount of lime to the slag respectively.

All the materials going into the cupola had been analyzed, as also those coming out. Test pieces were made throughout each heat, and constant records kept of blast pressures and volumes, temperature of the molten metal, in fact everything bearing upon the conduct of the melting operation. The results were carefully calculated, tabulated and no evidence found of any desulphurizing action.

It will be interesting to learn that the high fluorspar percentages had no effect on the silicon content of the castings. The percentage of lime in the slag was lowered quite considerably, and silica and alumina went up correspondingly, indicating that the lining of the cupola had been attacked badly. This is shown by the tabulation, in which for every 100 lb. of iron made, the slag with one-third fluorspar ran 7.4 lb., with two-thirds fluorspar it was 8.6 lb., and with fluorspar alone 9.1 lb. resulted. Using the limestone only, the slag made weighed 7 lb. per 100 lb. of metal.

## Fluorspar Additions and Fluidity

The lowering of the lime content in the slag reduced its basicity correspondingly, and this accounts for the lack of desulphurization. This fact led to two further studies: First, to judge the fluidity of the slag as the result of the fluorspar additions in the several proportions; second, the fluorine content of the slags obtained in each case.

Strange to say, while it is generally known that fluorspar makes the slag thinner, the special tests made show the reverse. Further investigation showed that undoubtedly the slag when first made was thinner, but as it attacked the lining the character changed, and eventually the slag came from the cupola just as viscid as if the fluorspar had not been used at all. Further tests on melting and softening points of the slags made with and without fluorspar verified this conclusion.

The most interesting feature of the investigations, however, was the fact that none of the slags, even those with all fluorspar fluxing, contained any fluorine, showing that this had been volatilized during the melting operation. The conclusions derived from the extensive series of tests may be summarized in the following: A cupola slag, obtained with admixture of fluorspar to the limestone used, is more viscid and less basic than when limestone of a high purity alone has been used. This, because the silica and alumina content has

been raised and the fluorine volatilized before the final stage of the slag formation has been reached, and it has covered the bulk of the molten iron.

#### Conclusions

It is therefore impossible to obtain desulphurization with fluorspar in cupola melting practice. The addition of fluorspar in cupola melting is therefore useless and may even be harmful, according to the authors of the paper reviewed. They should have added that from their own results this held good only where the limestone was of a remarkable purity, for with rather

impure limestone a fair desulphurization was brought about.

The paper, however, gives much food for thought, and shows the need of research on the part of the producers of fluorspar, to find out under what conditions of cupola operation and the degree of purity of the limestones used for fluxing their product will prove of actual value to the foundryman. That fluorspar is effective in open-hearth practice has been shown from the fact that up to 2.5 per cent calcium fluorides has been found in slags when fluorspar was used for thinning down the slag.

## Handling Large Tonnages of Coal

Two Traveling Towers Each of 350 Tons per Hour Use 3-Ton Buckets—  
Pulverizing System Prepares the Coal for Boilers

**A**MONG the notable features of the new East River generating station of the New York Edison Co. are elaborate provisions for handling coal and for preparing it in pulverized form for boiler use. The following paragraphs are taken from a comprehensive description of the station issued by the company at the time the plant was opened.

#### Coal Handling from Ships

Ten-thousand-ton ocean-going colliers will deliver coal direct to the station bulkhead, which, when completed, will extend about 738 ft. The colliers will be unloaded by two electrically operated traveling coal towers, each capable of handling 350 tons per hr., and with a traveling range of 307 ft. 6 in. along the bulk head. They will have 3-ton buckets, a hoisting speed of 930 ft. per min. and 65 ft. lift, the main hoist being driven by a 250-hp., 3-phase, 25-cycle, 2300-volt, 150-r.p.m. motor.

A ring-type crusher on each tower, driven by a 75-hp., 500-r.p.m. motor, will break the coal to 1½ in. and smaller sizes. Each tower will have a 36-in. x 60-ft. belt conveyor of 350 tons capacity, equipped with automatic scales. Coal from the crusher fed on to this conveyor, which dumps it on the landward side of the tower, will be taken to the outdoor storage yard by drag scrapers.

The coal storage yard, approximately 125 ft. by 400 ft., will accommodate about 48,000 tons. A drag scraper will handle coal into and out of storage, taking coal from a pile fed by the belt in the coal tower, or from a pile fed by a chute from the skip hoists. It will spread it over the storage yard to a depth of about 40 ft. It also will reclaim the coal from storage by delivering it to a hopper to feed the skip hoists.

#### Delivering Coal to Pulverizing Plant

Coal may be fed, also, to either of two 36-in. x 320-ft. belt conveyors on the bulkhead under the towers. These conveyors deliver it to two other conveyors, with automatic scales, which run back about 165 ft. from the bulkhead at right angles to the first pair, and deliver coal to a single 54-in. x 35-ft. belt of 750 tons capacity, which in turn feeds the skip hoists, located near the end of the mill house.

There will be two 5-ton skip hoists of the two-bucket balanced type, each driven by a 125-hp., 3-phase, 25-cycle, 440-volt, 750-r.p.m. motor. Their capacity will be 350 tons per hour, with a hoisting speed of 270 ft. per min. and a lift of 167 ft. They will deliver coal to two 36-in. belts, one 35 ft. long and one 29 ft. long, having automatic scales, which convey the coal to two 36-in. x 137-ft. belts located above the raw coal bunkers in the mill house.

In the present mill house are the raw coal bunkers,

dryers, pulverizers, transporters, air compressors and a.c. house turbine. The raw coal bunkers, with combined capacity of 5000 tons, divided in three sections, are supplied with coal by the skip hoist and belt conveyors. Duplex horizontal gates at the bottom of the bunkers control the coal flow to vertical coal dryers immediately below.

There are two dryers per mill, rectangular in sections and with cast iron steam grids through which the coal passes down to the mill feeders. Moisture-laden air from the dryers is drawn into a horizontal flue, from which it is exhausted by three motor-driven fans of 28,000 cu. ft. per min. capacity and discharged into six cyclone dust collectors.

Each mill, or pulverizer, is set upon a steel and concrete foundation on the ground floor, immediately below its two dryers. Each has two motor-driven feeders which regulate the flow of coal from dryers to mill. Between feeders and mill are magnetic separators to eliminate scrap iron. There are six 70-in. screen mills in the present installation, each with capacity of 15 tons per hr. and driven by a 250-hp., 375-r.p.m., a.c. motor.

Pulverized coal from the mill passes directly to the transporters, one per mill, which are vented through the exhaust flue to the dust collectors. They have a capacity of 25 tons per hr. and are connected into a transport pipe system, which carries the coal in two 10-in. headers to the boiler house. Here the coal may be sent directly to the 100-ton individual boiler bins. Or it may first be diverted to two 10-ton weigh bins and thence to the boiler bins, permitting weighing the coal fed to each boiler. From the boiler bins the coal is fed by d.c. motor-driven feeders to the burners, ten per boiler.

An automatic bin-indicating system will indicate the level of the powdered coal in each individual boiler bin.

#### Unusually Large Boiler Units

As it was necessary to occupy 104 ft. of the building width with turbine room and electrical galleries, only 102 ft. was available for the boiler room. The ultimate length available for boiler room is 910 ft., which is sufficient for 44 boilers, if this number is required, for an ultimate generating capacity of at least 1,000,000 kw.

The engineers decided, after careful study, on pulverized fuel burning. This is the first large installation of the kind to be made by the Edison company. The boilers, made by the Springfield Boiler Co., have each 14,809 sq. ft. of heating surface, exclusive of water walls or superheaters. The boiler has Murray fin-tubes for furnace walls, there being no brick, either inside or outside of walls. [See THE IRON AGE, June 4, 1925, page 1642, for description of this construction.]





# Survey Links Farm With Shop



Wisconsin Department of Agriculture Issues Bulletin  
on State's Metal-Working Industries

BY E. R. MCINTYRE

**F**OR many years the bogymen of the Western farmer was the "interests," a term that was applied indiscriminately to most industries. It is fair to state that the mutual distrust that existed between agriculture and industry had its roots in short-sighted policies pursued on both sides.

Today, happily, the farmer and the manufacturer are commencing to recognize their interdependence. In recent years joint meetings of industrial and farm organizations have been held, and so complete has been the change in sentiment that the latest striking evidence of friendly reconciliation comes from the State of Wisconsin, long known as a center of agrarian unrest. Curiously, a bulletin regarding the State's metal-working industries, reviewed in the accompanying article, was prepared by the Wisconsin Department of Agriculture as a means of educating the farmer in the importance of manufacturing activity as a basis for prosperity and as a market for farm products.

**A**T the eightieth anniversary of the first commercial iron mining on the southern borders of Lake Superior and the one hundredth anniversary of the opening of the lead and zinc mines in the Galena region, the State of Wisconsin has paused to take official cognizance of the vital part that its metal-working industries have played in building prosperity. A survey of those industries has just been issued by the State Department of Agriculture.

At first glance, it strikes one as incongruous that an agricultural control bureau, chiefly concerned with cattle tests and statistics on farming, should issue a bulletin of 128 pages, profusely illustrated with pictures of foundries, iron mines, steel mills and heavy machinery. Why should it devote several pages to an explanation of the difference between pig iron and iron castings, and why should it tell how aluminum goods, bathtubs, steel ships and stoves are manufactured?

## Marketing, Not Production, Present Farm Problem

The reason is simple. Wisconsin has reached the point in its agricultural career when land clearing and hasty farm expansion to new regions to the north is not desired, or at least it is not a major activity of the immigration bureau of the Department of Agriculture, as it was 10 years ago. Wisconsin farmers need more consumers of their diversified food products rather than more producers to pile up the surplus at great economic risk.

The survey of the metal-working industries of Wisconsin is the second bulletin in a series treating the factory resources of the State. The wood-working industries have been similarly, but not so fully, handled in a former bulletin. This latest publication is dedicated to the schools and the citizens of the State, as a recognition by Wisconsin farmers of the close relation that exists between food and iron; between producers of grain, milk, fruit and meat, and the producers of the things which enter into the easier solution of everyday jobs on the farm.

The Wisconsin Manufacturers' Association, supported in part by the operators of metal-working in-

dustries, has just donated \$50,000 to a study of a severe cattle disease raging in Wisconsin, and the agricultural college men are busy at research on this problem with that fund.

The same association, through its metal-working industries, has undertaken a campaign to increase the consumption of milk and dairy products by employees in its factories. One plant alone is taking \$20,000 worth of fresh milk for its employees annually, distributed every working day to the men at the lathes and forges. In fact, the entire dairy output of Wisconsin has seen a change in direction—from an outlet to butter and cheese toward a greater outlet as fresh fluid milk for consumption in the manufacturing cities. Producing fresh fluid milk is considered better economy for the dairyman than turning his milk to manufacturing channels.

Instead of sitting down and idly bemoaning the "drift to the city," the farmers of Wisconsin are turning to a study of the relation that exists between manufacturing and agriculture, so that their own prosperity and that of the men in the shops may coincide.

## What Farmer Discovers About State's Industries

The farmer finds, upon turning the pages of the metal trades bulletin just issued, that his State ranks first in something else besides cows and cheese. He learns that during 12 months ended last November the State prison plant at Waupun used 332 tons of sheet steel in making license plates for automobiles and trucks. He notes with surprise and no little pride that Wisconsin takes first rank in the metal industries of the nation in the following items:

Heavy-duty pumping engines for civic waterworks; marine engines for ferry-boats, outboard small boat motors, ore crushing machinery, concrete mixers, dredging and excavating machinery (77 out of the 100 steam shovels that dug the Panama Canal came from Wisconsin), ensilage-making machines, sawmill machinery, wood lathes and finishing machines, bottle cleaning equipment and dairy utensils.

Wisconsin takes second place among the States in the manufacture of steam engines, tractors and

traction engines, motor-vehicle engines manufactured for sale, the manufacture of farm implements in general, aluminum products, dairy machinery and pulp mill equipment.

The smallest metal items produced in the State are copper wires and dental drill points. The largest are steel car-ferry boats and giant ore crushers weighing a million pounds and standing more than 25 ft. high, used in the mines of the Andes mountains.

Among other facts disclosed in the bulletin are that Milady's wants are catered to by the maker of tiny metal tubes to hold lipsticks, while at Niagara Falls is a hydroelectric power unit made in Wisconsin that develops 70,000 hp. and weighs 600 tons.

#### Wide Use of State's Industrial Products

The farmer, moreover, learns that a Wisconsin threshing machine is doing duty 10 miles from Nazareth in Palestine; that Donald B. MacMillan's polar ship, Bowdoin, was propelled by a Wisconsin marine engine; that Indians in Puget Sound fisheries and rubber explorers on the Amazon use Wisconsin outboard boat motors; that the largest mine hoist in the world was installed by Wisconsin craftsmen in a Michigan copper mine; that 45 foreign countries from Spitzbergen to Tasmania employ Wisconsin dredges and shovels, and that the first typewriter and the first binder-twine knotter were made in Wisconsin.

He is introduced to some industrial history also in perusing the pages of the State bulletin, giving him a background with which to sense the magnitude and complexity of metal-working arts that have grown up beside the feed lots and the furrows.

#### Lake Superior Ore Bodies Discovered by Half-Breed

He reads how the first iron mining company on the south shore of Lake Superior was formed in 1845 after the discovery of valuable holdings through information given by a half-breed Indian, Louis Nolan, and old Chief Man-je-ki-jack. He learns more about the early system of blast furnace operation in Wisconsin and the use of charcoal as fuel, burned by pioneer settlers as a side line to clearing their farms. He finds that there are three counties in the State with active iron mines—Florence, Iron and Dodge.

He traces the early lead mine fever of the 'twenties

and prepares to help Mineral Point and New Diggings celebrate the one-hundredth anniversary of the Galena invasion—the key that unlocked the door to agricultural Wisconsin.

Wisconsin's lead and zinc mine area is 40 miles wide and 70 miles long, located in the extreme southwestern corner, extending over three counties of Wisconsin and one each in Iowa and Illinois. Less than 3 per cent of this area has been prospected or mined. Most of the operations are conducted on leased ground—sometimes on rich farms—the landowners receiving 10 per cent of the gross receipts from ore sales.

#### Importance of Wage Earners as Consumers

With nearly 90,000 wage earners employed in its metal-working industries, or about 35 per cent of all manufacturing employment in the State in 1924, earning about \$140,000,000 annually, this great field affords a sure market for the goods of the farms.

The reader also learns that about \$248,000,000 was added to the value of the materials by the workmen in the metal industries during one recent year, upon a basic in-going cost for materials of about \$245,000,000. He finds that the metal trades employees have complex tasks to master and their leaders have to study constantly to keep step with new methods of management and manufacture.

Out of knowledge comes respect; and from this it is but a step to confidence and friendship. It will not be surprising if Wisconsin farmers quit complaining of their own "hard luck" and take an inventory of the resources of the State in which they live and their factory customers with whom they rub elbows.

Although written by a farm department and issued first to farmers, this Wisconsin survey will be welcomed by metal industries. The metal industries gave great assistance in preparing the bulletin, which is considered authoritative and reliable for general reference.

It is probably one of the first instances on record where a department devoted to agriculture and to agricultural immigration and expansion has left the beaten track to seek fields once thought remote, but which, in the new era of close-knit relationships, brings the devotees of Tubal Cain and the Sons of Adam into one tent.

### Foundrymen's Committee Recommends Cast Iron Research

At a meeting of the cast iron committee of the American Foundrymen's Association, held at Philadelphia on March 16, the need for organized research in cast iron fields was discussed. As a result of the meeting, recommendations to the A. F. A. were approved which involve a comprehensive study of the cast iron problems.

The committee recommended that a complete bibliography of the existing literature of cast iron be first prepared. This bibliography will cover the foreign as well as American publications and when finished the articles will be classified under various subheadings. Following the preparation of this bibliography, the committee is to select all articles of value and summarize the information under each subdivision. From this summary the committee will formulate a research program to furnish information which is shown to be lacking.

In addition to the above activity, the committee is endeavoring to complete arrangements for an immediate investigation of the effect on the quality of pig iron of the use of borings and turnings in blast furnaces. The need for this has been recently emphasized by the publication of divergent views. This investigation will be discussed at the conference of pig iron qualities to be held at the Chicago convention of the American Foundrymen's Association the week of June 6. The conference is to be held for the purpose of in-

teresting pig iron producers and users in bringing out any definite information on the effect of scrap in the blast furnace and of other factors affecting the quality of pig iron.

### Foundry Equipment Sales Gain

Sales reported for February by members of the Foundry Equipment Manufacturers' Association totaled \$684,836, or a gain of 4 per cent, compared with the figure for January. An increase of 41 per cent was shown over sales in February, 1926, while the total for the first two months this year showed a gain of 26 per cent over the figure for the same period last year. Shipments in February, 1927, at \$484,699, were 29 per cent larger than in the previous month and 4 per cent greater than in February, 1926. Orders on hand March 1, 1927, totaled \$1,086,310, a gain of 15 per cent compared with Feb. 1.

Production of bituminous coal during the week ended March 26 is reported by the United States Bureau of Mines at 13,375,000 net tons. This compares with 13,009,000 tons in the preceding week and with 13,778,000 tons in the week before that. The total production in the coal year up to March 26 has been 592,836,000 tons. This is an increase of more than 60,000,000 tons over the preceding year and is the highest total since the war.



# Problems Foundrymen Must Solve

Gray Iron Industry Has Need for Cooperative Effort  
to Meet Changed Conditions Affecting Prices of  
Its Products and the Demand for Them

**M**EMBERS of the Gray Iron Founders' Association, Cleveland, found food for thought in an address made by Philip Frankel, the association's secretary, at their monthly meeting held on March 24. Mr. Frankel, who is a member of the law firm of Frankel & Frankel, has long been connected with trade association activities, and has represented the light gray iron founders of Cleveland for more than 20 years. In his remarks at the March meeting, in summing up the accomplishments of the organization, he referred to the growing feeling of cooperation and friendliness as outstanding. Much had been done also in the handling of labor problems, and in the study of foundry costs and of mechanical and metallurgical phases of foundry operation. There had been great gain, furthermore, from the exchange of views each month on business conditions and on the market situation in respect to fuel, pig iron and the products of the foundry. Passing from these considerations, the speaker took up matters of larger import as affecting the future of the industry and declared that foundrymen had not studied as they should the changes that were going on within and without their field. The substance of this portion of the address is given below:

## Effects of Hand to Mouth Buying

For the past three years I have listened to foundrymen's reports showing little or no progress in the development of the gray iron industry. Hand to mouth buying has been prevalent for about that long. Years ago, purchasers of castings would order ahead. Contracts were made for three and six months delivery, by users of castings and by foundrymen. What do we find today? The foundrymen in this room haven't business 30 days ahead, and probably half of them haven't enough to keep the foundry going two weeks ahead. And what is being done in a serious way to meet that situation? Many foundrymen have been waiting complacently, month after month, hoping for conditions to change so that it may perchance be a seller's market, instead of the buyer's market that has prevailed for the past three years, thinking that if a seller's market comes again hand to mouth buying will cease.

Now, is hand to mouth buying going to stop? I am not so certain about that. Much is going on in other industries indicating that plans are being made to continue business in this new way. Producers do not now have to carry large inventories. Deliveries are speedier, both of the raw materials the manufacturer buys and of the products he makes for his customers. For these and other reasons, people in many lines of business feel that hand to mouth buying is not a bad thing—so much so that many of these manufacturers in other industries are adjusting themselves to the new order of things.

Business men apart from industry also feel that hand to mouth buying has come to stay for an indefinite time. New methods of retail merchandising have encouraged such buying, as have also the chain store organizations. Study ought to be made by those engaged in the foundry industry in order to determine whether hand to mouth buying is going to be with us for an indefinite time, so that from the conclusions arrived at you can lay your plans and adjust your policies accordingly.

Some other things have happened since the World

War. Production facilities in the light gray iron castings industry have shown a marked increase. Some estimates put it at 100 per cent since 1914. Foundries have doubled and trebled in capacity. Also many large users of castings found their purchases from light gray iron foundries doubled and trebled. Some of these users felt that they would be better off, from the standpoint of service as well as of price, if they produced their own castings. Thus it has happened that many users of castings built foundries of their own. In some cases they have seen their business fall off so that they would not require all their foundry capacity and they have gone into competition with your jobbing foundries. They have found it necessary to operate these foundry departments in order to keep the overhead down, or simply to break even. Many users of castings in the automobile industry, whose business grew by leaps and bounds, also added foundry departments. This did not help the situation.

The use of the truck and the automobile and the improvement in railroad transportation have changed methods of distribution, not only in the foundry industry, but in every line of business. If you will scan your list of customers today, you will find that instead of many of them being at distant points, the majority are close at hand. This has been another of the new factors affecting foundry operations.

Due to the same forces that have been mentioned, other branches of the foundry industry have extended their fields and you have competition from malleable and steel foundries. In addition, pressed sheet steel is being offered as a substitute for castings, and stamping and forging manufacturers are offering their products in place of gray iron.

## New Conditions Call for Action

What is being done to offset the efforts in these various directions? It is true that individual foundries are making more strenuous campaigns for business, and perhaps the head of the foundry is doing more traveling today than ever before, in the pursuit of orders, but what concerted study are the gray iron founders making as a group that they may be able to offset the new influences I have mentioned?

Not a little foundry space might be devoted to other purposes than the making of castings. It is a question also whether the merchandising of light gray iron castings has had the same intensive study that has been given to the sale of products in other lines. The continuance of your industry demands that serious consideration be given to the development of further markets. Too many foundrymen have lulled themselves into a feeling of letting well enough alone, believing that there has been only a temporary diversion of business that some day will come back, not realizing the extent to which conditions have changed.

In the consideration of new products for manufacture it will be well to seek the cooperation of the departments at Washington. The results of research carried on there are available to every line of business. Publicity rightly used will acquaint users of castings and prospective users with the superiority of light gray iron for many purposes.

## Building Foundry Departments Should Be Discouraged

Perhaps thought should be given to the merging of foundries, and some of the excess foundry capacity could be disposed of by the sale of properties to other lines of business, or by devoting a part of it to the manufacture of other forms of product. There should be

concerted effort to discourage the addition of foundry departments by industries which now buy their castings. By properly directed effort manufacturers who contemplate putting capital into the manufacture of their own castings should be led to see the advantage of continuing to purchase from existing foundries. Such manufacturers, it could be demonstrated, would be better off with two or three sources of supply able to give them all they desire in the way of service, and they could purchase their castings just as cheaply as they could make them, and probably more cheaply, to say nothing of the labor difficulties and other burdens

they would take on in starting foundries of their own.

In the consideration of all the matters I have referred to, it should not be difficult to secure the cooperation of the pig iron producers, since the foundrymen's problem is to a great extent their problem. Nor should the effort to find a solution be confined to members of this association, though the association might well sponsor intensive research into the merchandising of castings. Representative producers of light gray iron castings should be invited to a conference for a discussion of the situation and the devising of means for its betterment.

## Jobbing Foundry Has Unique Feature

Output Larger on Non-Union Basis—Profits Large and Costs Known—Patterns Collected and Castings Delivered—Local Advertising a Source of Success

A **J**OBGING foundry which, by rendering prompt and dependable service, has developed a large and profitable business and is producing an unusually large output for the size of the plant and the number of employees, is that of the Detroit Gray Iron Foundry Co., Detroit. An interesting talk on the production, organization and sales methods of this plant was given by Hugh Martin, president of the Foundry company, before foundrymen of the Cleveland district of the Ohio State Foundrymen's Association in Cleveland, March 28. The talk followed a dinner attended by nearly 50 members.

### *Large Output Per Employee*

The foundry has a floor space 80 x 400 ft. and in this an average of 150 tons of castings are poured, cleaned and delivered per day with a total employment of 125 persons. The usual number of molders is 50.

This might be classed as a highly specialized foundry, as the bulk of the output is in punches, pads and rings for dies for forming fenders and other sheet metal parts for automobile bodies. These castings weigh up to 18 tons and some have solid metal 22 in. in thickness. The large output for the size of the plant is due to the large castings made and to the large number of men employed for the size of the foundry. No production work is done but, in addition to dies, the foundry makes miscellaneous small parts such as jigs and fixtures.

The foundry collects the patterns and delivers the castings so that it has the entire responsibility for quick service demanded by automobile companies and body manufacturers. When a pattern reaches the plant, a tag is attached to it indicating the time received, order number, number of castings to be made, delivery time and the number of core boxes required. As soon as it is tagged, it is sent to the core room if cores are to be made. If cores are not required the pattern goes direct to the molding floor.

### *Most Work Done on a Piece Rate Basis*

Nearly all work is done on a piece rate basis. Even the pouring gang is paid on a piece rate basis and the shipping department is also on such a basis. Loyalty of the men is one of the features of the plant and they work late at night when necessary to get the work out. The molders object to being put on a day rate which is sometimes necessary when a new job comes to the foundry. The molders average \$8 to \$9 per day and many make \$1.50 per hr., as compared with the hour rate of 85c. Helpers are paid 60 per cent as much as the molders.

Mr. Martin said that scrap losses have been only about 3 per cent over a 3-year period. One reason for the low scrap loss was that the men are not paid for scrapped work. No molding machines are used; 12 cranes are provided for handling. All ramming is done with pneumatic rammers. Wood flasks are generally used, the speaker explaining that the reason for this was that they could not handle iron flasks fast enough. The only exception is the use of a few steel flasks. Seven carpenters are kept busy all the time making new flasks and repairing old ones.

Low-silicon charcoal pig iron is used to get a file

finish on castings for dies. The mixture is 800 lb. of charcoal iron, 800 lb. of malleable scrap and 400 lb. of malleable pig iron. A supply of old steel rails is kept on hand and this material is used in place of malleable scrap when the latter is not available. With iron made of this mixture, the metal is poured against a chill surface without causing a shrinkage in the iron.

As a rule, every job is molded and poured in one day, although two days is taken for some large castings. Ninety-five per cent of the material used is loaded directly from cars to the cupola platform. The castings are not given a fine finish in the cleaning room. They pass from the molding floor to the sand blast, then they are ground with pneumatic grinders and taken back to the sand blast and then on to the chipping rails and from there to trucks for shipment.

### *Larger Output as a Non-Union Shop*

Up to four or five years ago the foundry was operated as a union shop and the average production was 700 lb. per man per day. Now, with its operation as a non-union shop on piece work, it is producing slightly under 4000 lb. per day per man. This includes a limited amount of bench work.

### *Profits Large and Costs Known*

The only supervision for the 125 men employed is one superintendent, a foreman of the core room, a foreman of the yard and a night foreman. The office force consists of two men and five girls, one of the latter being a telephone operator. With this organization the company is doing a business of \$1,500,000 to \$2,000,000 per year. Because of the lack of capacity, it is now building a \$600,000 foundry.

Last year Mr. Martin said the plant made a profit of \$220,000, after \$100,000 had been divided between him and his partner. In referring to the profitable operation of his plant, Mr. Martin said that he always knew the cost of making castings and added a certain amount for profit. If another foundry took the job at a lower price, he knew that it could not make money on it.

### *Advertising One Secret of Success*

He described, as one reason for his company's success, an advertising campaign that it has conducted. It placed this in charge of an advertising agency and spent \$1,000 to \$1,200 per month in advertising in Detroit papers. Interest was aroused by showing illustrations of foundry operations in the advertising material. The advertising, he said, placed competitors on the defensive as they would go to a customer and say that they could make as good castings and as good delivery as the Detroit Gray Iron Foundry Co.

Mr. Martin spoke of an inquiry from two large Michigan automobile plants for jigs and fixtures and said that he asked them if they would be willing to pay him what it would cost them to make these castings. As a result they inquired into their cost of doing jobbing work and found that, with an average overhead, it was 26c. per lb. In this connection he remarked that he saw a jig that was being made in a Cleveland foundry for which the foundry had difficulty in getting 4c. per lb.



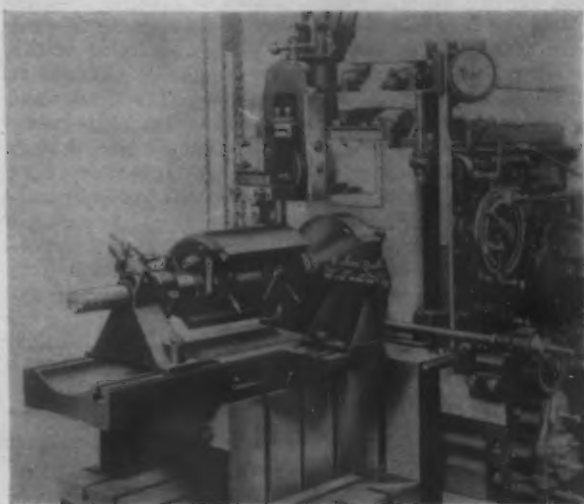
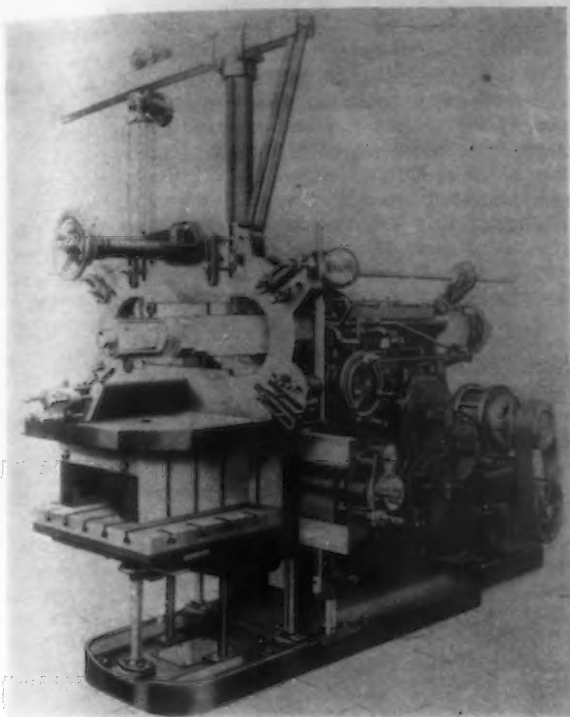


Fig. 1 (at Left)—The Machine Is Adapted for Finishing Railroad Work on a Production Basis. The double chuck facilitates set-up of driving boxes

Fig. 2 (Above)—Shell or Crown-Brass Planing Attachment. The work is held rigidly and heavy cuts and coarse feeds may be taken

## Heavy-Duty Railroad Shaper of Improved Design

Attachments Provided for Machining Driving Boxes, Shoes and Wedges, Rod Brasses, and Other Work on Production Basis

A HEAVY-DUTY draw-cut shaper of improved design and arranged especially for railroad work has been brought out by the Morton Mfg. Co., Muskegon Heights, Mich. The machine has a cutting stroke of 36 in., a horizontal feed of 36 in. and a vertical feed of 21 in., all of which are automatic and can be changed while the machine is in operation.

This tool will slot and finish driving boxes complete, on a production basis, and can be equipped with a shell or crown-brass planing attachment, shoe-and-wedge attachment, rod-brass attachment, and the company's special chuck for holding driving boxes while machining the shoe and wedge fit. The improved double chuck for use in slotting driving boxes is shown in the full view of the machine, Fig. 1. Adjustable stops and binders are used to secure the various sized driving boxes in the chuck. Savings

in the setting-up of the driving boxes are claimed for this chuck. The new shell or crown-brass planing attachment is shown in Fig. 2. The brass is held rigidly, since the cutting strain comes against the rear head of the attachment and is transferred through backing screws to the face of the column of the machine. Heavy cuts and coarse feeds may be taken. A hooking or shearing tool may be used for roughing, and this, it is claimed, increases the efficiency by reducing the cutting friction. It is further stated that by using a slightly concave tool for finishing, a true surface may be obtained with the lines cut in the same direction as the lines cut in the driving box. This method of machining insures a proper bearing, and the finished crown brass is ready for pressing into the driving box with only one binding of the work.

Fig. 3 shows the machine equipped with the new

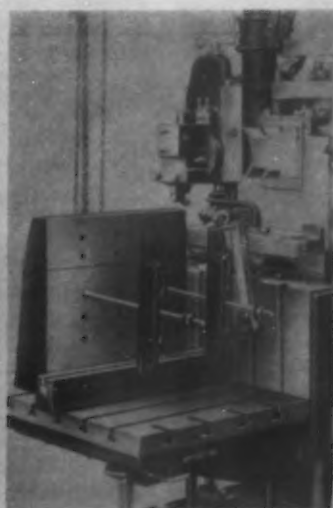


Fig. 3 (at Right)—Shaper Attachment for Finishing the Face Bearing of Shoes and Wedges After They Have Been Laid Out and Lined. Fig. 4 (at Left)—Various Sizes of Connecting Rod Brasses May Be Held While Machining the Strap Fit. Fig. 5 (Center)—Special Chuck for Holding Driving Box While Machining Shoe and Wedge Fit. Quick set-up of the work is a feature

shoe-and-wedge attachment, which is designed for finishing the face bearing of shoes and wedges after they have been laid out and lined. The construction of this attachment is such that it may be quickly adjusted to meet various angular requirements. The shoe and wedge is secured in the attachment before adjustments are made, which is emphasized as saving time lost in the ordinary methods of shimming up. It is stated that one roughing and one finishing cut will produce accurate work on a production basis.

The rod-brass attachment, shown in Fig. 4, is designed to hold connecting rod brasses of various sizes while machining the strap fit. With the chucking ar-

range employed it is unnecessary to sweat the halves together before machining. The attachment is also arranged to operate at 45 deg. angles, which permits the machining off of the corners of the brasses without extra set-ups. The arrangement of the new special chuck for holding the driving box while machining the shoe and wedge fit may be noted from Fig. 5. This chuck is intended to permit quick set-up, and this, together with the stock-removing capacity of the heavy-duty machine, is said to enable this operation to be done on a production basis. The dovetail angular slots are very easily cut by shifting the bracket and the box on the large table to the desired angle.

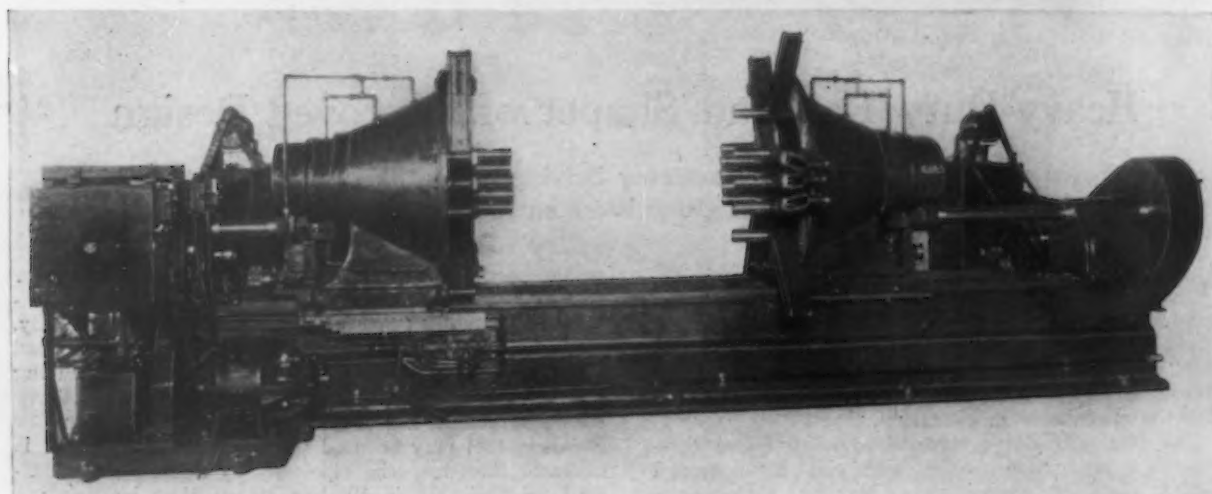
## Horizontal Multiple-Spindle Drill with Hydraulic Feed Control

Multiple-spindle vertical drilling equipment with hydraulic feed control, built recently by the Harrington Co., Seventeenth and Callowhill Streets, Philadelphia, for the drilling of heavy structural beam and column sections, was described in *THE IRON AGE* of Feb. 24, page 579.

Companion equipment, a horizontal multiple-spindle machine with automatic hydraulic feed control, is shown in the accompanying illustration. The vertical

until the end of the bar is reached, when quick-return is effected automatically, both heads returning to the starting position. The pedal is then depressed and the cycle of operation repeated.

To assure uniform feeding of both heads, equalizing bars are provided at the rear of the bed of the machine. The heads are driven by two 40-hp. motors, one at each end of the bed. Both motors are controlled by push buttons at the operator's position. The drive from the motors to the head units is by means of gears and silent chains. Safety features to prevent damage from jamming of the heads or drills are provided as in the



*Rapid Traverse, Feeding and Quick Return Movements Are Controlled Automatically. Equalizing bars provide uniform feeding of both heads*

unit previously described was designed for drilling the web of the structural sections, and the horizontal machine with opposed heads, here shown, is for the simultaneous drilling of both flanges of beams and columns up to 31 in. in depth.

The drilling heads are actuated by an Oilgear pump unit which consists of two elements, a constant-delivery low-pressure pump for the rapid traverse and quick return movements, and a variable-delivery high-pressure pump for the feeding movements. Oil under pressure is delivered to two cylinders mounted between the ways at each end of the bed. The piston rod from each cylinder is connected to the head which it drives.

Movements of the drilling heads are controlled automatically by means of three bars fastened to the left-hand head of the machine. These bars are independently adjustable to engage the hydraulic valve control at predetermined points in the drilling operations. With the spindle heads in their extreme outward position, the operation of this control mechanism is as follows: The pedal below the left-hand head and at the base of the machine is depressed by the operator, which opens the control valve of the Oilgear pump. At the same time, a trigger connected with the control valve is brought into contact with the outer of the three bars, causing both drilling heads to travel rapidly toward the center of the machine. At a predetermined point the trigger slides off the outer bar and makes contact with the middle bar, reducing the head movement to a coarse feed until the trigger comes in contact with the third bar. The third bar gives a fine feed

vertical machine previously described. Ample provision is made for lubrication of the spindle units. Spindle gears are of alloy steel.

Two complete sets of spindles are furnished, one, designated as the No. 9, being intended for driving up to 1 5/16-in. drills, spaced at minimum center distances of 2 1/4 in. The other spindles are designated as the No. 6 and are for driving up to 7 1/8-in. drills at minimum center distances of 2 1/4 in. The spindle units are of the company's "screw lock" type, previously described, and "oil-well" universal joints are also furnished. Chucks are of quick-change type to facilitate rapid insertion and removal of drills.

## Oil Flow and Heat Transfer in Pipes

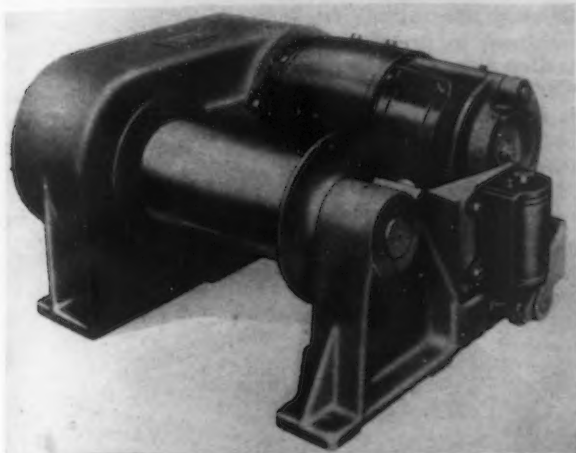
Incident to teaching hydraulics to classes, including students of petroleum engineering, Prof. J. B. Butler, of the School of Mines and Metallurgy, University of Missouri, became interested in formulas and data relating to the flow of oil in pipes. Enlarging the subject to include the flow of all fluids and also the heat transfer from fluids flowing in pipes, Professor Butler has compiled a bibliography which has now been published by the University. It is of 62 pages and runs from 1732 through 1926, with a total of 370 definite references.

It is cross-indexed. The main list is chronological, but an author list, a subject index, and index to periodicals since 1880 are included, each of these three referring by serial number to the main chronological list. The principal formulas are discussed in the preface.



## Electric Hoist for Car Pulling and Other Uses

A new electric hoist, arranged for mounting in a fixed position, either overhead or on the ground, or for mounting on skids for use as a portable unit, has been added to the Lo-Hed line of the American Engineering Co. of Philadelphia. The machine may be employed



*The Hoist May Be Fixed Overhead or on the Ground and Used for a Variety of Work*

as a car puller, in elevator work, in ash handling and in pulling loads up inclines. The lifting of furnace doors and the handling of spouts in steel mills are among the other uses for the hoist, which is available in several sizes for loads from 500 to 4500 lb.

The standard machine consists of a smooth drum, driven by a motor through a train of spur gears and mounted on a common bedplate. The motor and gears are entirely inclosed. Gears are of drop forged steel, heat treated and run in an oil bath. Gear shafts are mounted in Hyatt high-duty roller bearings. The drum has large flanges to prevent the rope jumping the ends and to give maximum stowage capacity. One bearing of the drum shaft is lubricated by splash from the gears and the other by an Alemite fitting. A ball-bearing motor, especially designed for hoist service, is employed. The controller is of the single-speed, reversing drum type. The same machine with various modifications, such as grooved drums, air motors or steam motors, push-button and remote control, holding and lowering brakes, extension shafts with additional heads, can be furnished if desired.

## Largest Timken Roller Bearings

The largest bearings thus far built by the Timken Roller Bearing Co., Canton, Ohio, have been recently shipped for installation in a compeb mill built by the Allis-Chalmers Mfg. Co., Milwaukee. These bearings,



*The Bore Is 42 In. and the Outside Diameter 61½ In. The weight is more than 2 tons*

one of which is shown herewith, have a bore of 42 in. and an outside diameter of 61 9/16 in. At 30 r.p.m. they have a capacity of 2,750,000 lb. The weight is in excess of 2 tons each.

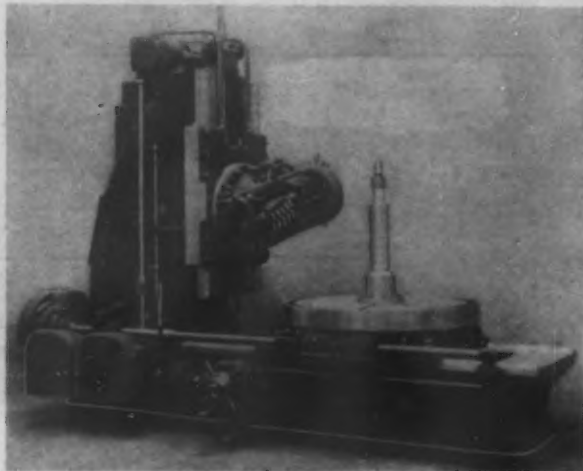
The machine on which these bearings are to be used is credited with being the largest compeb mill in the world. It will be put in service in a plant manufacturing Portland cement. The diameter of this mill is 10 ft. and 9 ft. and the length 45 ft. It is used to take the clinker from the cement kiln and grind it to finished cement in one machine.

An advantage claimed for the use of tapered roller bearings in this machine is the material reduction of the overall length of the machine, since the width of the bearings used is only 13¼ in. In being adequately inclosed, these bearings obviate the necessity of renewing the lubricant supply except at infrequent intervals. The tapered construction of the bearing is stressed as permitting the carrying of loads, regardless of direction, without the use of thrust plates or special thrust bearings.

## Improves Gear Hobbing Machines

An improved model of the Pfauter gear-hobbing machine, marketed in the United States by the O. Zernickow Co., 15 Park Row, New York, has been announced.

The machine has been made heavier and more powerful, and the main upright driving shaft is now



*The Machine Has Been Made Heavier and Refinements Have Been Incorporated*

provided with a heavy flywheel at the bottom. A flywheel can also be furnished on the cutter head, if desired. Both the upright and the bed have been made wider and heavier. The cutter head slide is wider than heretofore, and the cutter head has been redesigned to minimize the overhang. All controls for operating the machine have been concentrated on the operating side. The table construction has been changed, the table bore of the new machine having no obstruction below which would interfere with the passing of a pinion that is integral with shafts through a hole in the table. This hole extends clear to the floor.

Cone pulley drive has been eliminated, and the machines are arranged for single pulley drive, with change gears. The single pulley runs in double roller bearings, and other bearings are ring oiling. The entire drive is inclosed in a cast iron housing with only one opening for the belt. The change gears controlling the hob speeds are located in a cast iron housing with hinged cover. When arranged for individual motor drive, the pulley is replaced by a gear, and the motor is coupled direct with the machine by means of a pinion. A countershaft is included in the standard equipment. Where space permits the machine to be driven direct from line shaft, the countershaft is omitted, and the main drive on the machine is arranged with a clutch, which stops the machine automatically when the cut is finished.

By means of change gears, an unlimited number of feeds can be obtained. In addition, there is incor-

porated in the feed mechanism a device which allows the operator to obtain three different feed changes by means of a push-pull spindle without changing gears.

The patented hydraulic table balancing device has been completely redesigned and simplified. A small motor with pressure gage has been mounted directly to the table base, thus eliminating the telescoping oil tubes, and other piping and fittings formerly used.

### Extends Monorail System Into Box Cars

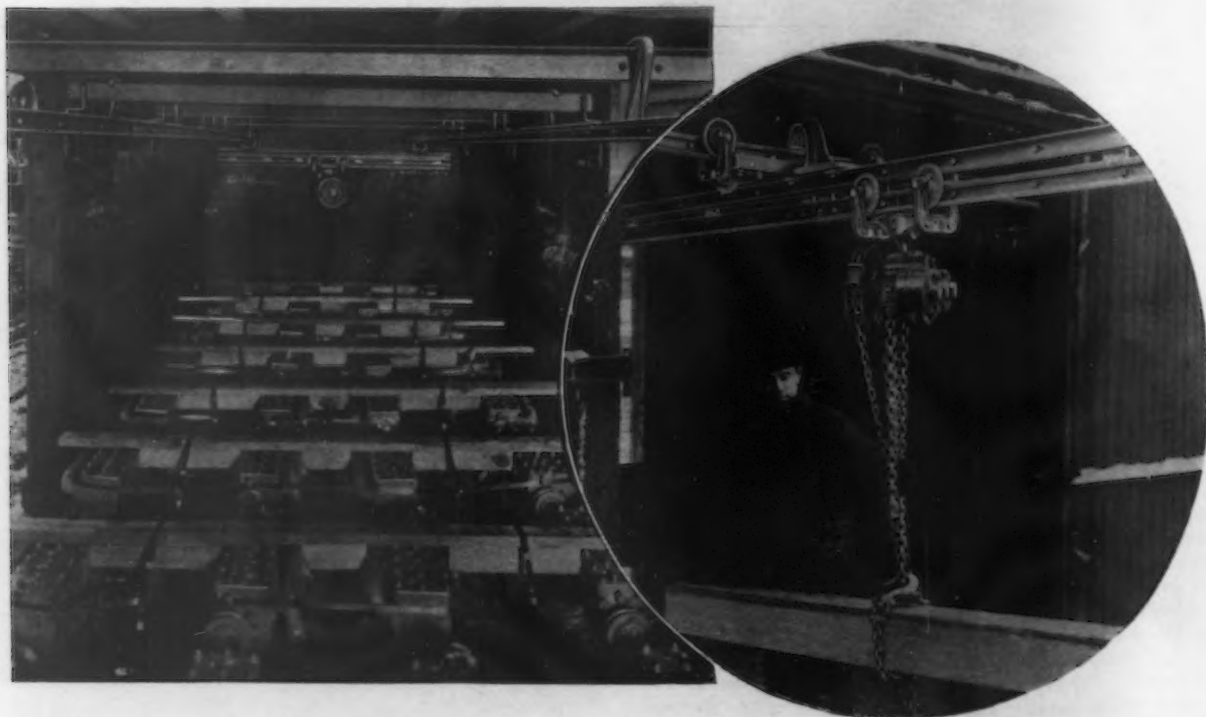
A new development in monorail conveying equipment is a loader that makes all parts of a box car accessible to loaded trolleys coming from a plant production department or a loading platform. Hitherto

stringers supporting the crane runways are adjustable to correspond to different widths.

When a box car is spotted opposite the projecting end of a loading platform monorail system, the crane bridge is moved to the car door and placed in alignment with it and latched into place. The loaded trolley is then run on to the crane bridge, the latch is released, and the load is moved to the desired point in the car. The releasing of the latch automatically places a safety stop at the free end of the loading platform monorail to prevent the possibility of any following trolley from running off the track.

The box car loader has a capacity of 4000 lb. and is made entirely of steel shapes, steel rails, and steel brackets. These will withstand dropping on the car floor and other hard usage.

To dismantle the unloader and make ready for the next car job, the crane is removed and the supporting



*At the Right a Trolley Is Shown Passing from the End of a Loading Platform Monorail to the Crane Bridge in the Box Car. The crane bridge is latched to the end of the outside monorail to form a connection. At the left is a box car which was loaded with motors at the plant of the Continental Motors Corporation, Muskegon, Mich. Ten monorail box car loading units are in service at this plant*

the principal limitation to the use of a monorail for this work has been that it was necessary to stop at the car door and that it was not possible to unload directly from the monorail into any part of the car.

The equipment shown, which is manufactured by the American MonoRail Co., Cleveland, can be fitted up in any box car in 15 min. or less, it is said. Two men can assemble it ready for use, and it can be dismantled and removed from the car in less than 5 min., it is stated. No permanent extra fittings are required in the car, and since all parts of the equipment are suspended near the car roof, they can be removed from loaded as well as empty cars.

To prepare the box car to receive the unloader, a series of steel brackets, with an offset bend toward the upper end and provided with slotted holes at the lower end, are nailed along the sides of the interior of the car. Into the upper slots of the brackets are slipped a series of transverse stringers, which in turn support hangers carrying runway rails for a crane bridge to run on.

The loader is essentially a short transfer crane assembly operating on two parallel lines of crane runway extending the full length of the car. The crane bridge is carried by special designed trolleys, which carry the bridge high-up between the runway rails, thus obtaining maximum headroom clearance.

The unloading equipment is constructed to be adjustable for cars from 36 to 40 ft. in length, and the

stringers are lifted out of the side brackets. The brackets, which are nailed to the side of the car through key-hole sockets, are then disengaged and removed, the nails being the only things that are left in the car.

### Investigation of Twist Drills

Power consumption at the drill point in drilling gray cast iron or steel decreases as the helix angle is increased from 15 to 45 deg. This is one of the conclusions reached at the University of Illinois Experiment Station by Bruce W. Benedict and Albert E. Hershey. Their investigation has been under way for more than 10 years, with an interruption between 1917 and 1920. It is published as bulletin No. 159, which may be obtained from the University of Illinois, Urbana, for 40c.

Drill endurance in drilling gray cast iron or steel at normal rates is not materially affected by changes in helix angle from 26 to 45 deg. In certain carbon or alloy steels, however, at high drilling rates, the endurance of drills with helix angles between 28 and 35 deg. is greater than with angles outside those limits. This factor of endurance appears to be governed more by the character of the materials drilled and the conditions of drilling than by the size of the helix angle. Considering the principal factors affecting drill design, helix angles from 32 to 35 deg. give the most satisfactory performance in gray cast iron and steel. An extensive bibliography covering the past 10 years is given.



## Malleable Iron Research Institute, Inc., Replaces American Association

Incorporated under the name of the Malleable Iron Research Institute, with headquarters in the Union Trust Building, Cleveland, a new trade organization has been formed to take over the work of the American Malleable Castings Association. The institute is incorporated to provide a working business organization with a name more exactly descriptive of its purpose than the previous association.

The Malleable Iron Research Institute, Inc., has adopted a program, the objects of which are set down in its charter as follows:

- 1.—To foster and increase the use of malleable iron castings.
- 2.—To carry on laboratory and metallurgical research work for the purpose of improving the quality of malleable iron castings.
- 3.—To establish and maintain standards of quality and to develop new markets and uses for malleable iron castings.
- 4.—To do and promote by all lawful means:
  - (a) The exchange of ideas and experience relative to the process of manufacture of malleable iron castings and improvements therein.
  - (b) To further the establishment of correct and accurate systems of cost accounting in malleable iron foundries and the compilation and dissemination of correct statistics of costs of production.
  - (c) The collection, compilation and dissemination of statistics relative to the production of malleable iron.

The officers of the institute are:

President F. L. Slyer, president Northwestern Malleable Iron Co., Milwaukee.

Sec. and treas.: Robert E. Belt, Union Trust Building, Cleveland.

Consulting engineer, in charge of research laboratory: Enrique Touceda, Albany, N. Y.

The business of the institute will be carried on by a board of directors, through five standing committees. In order to establish a uniformly high standard for malleable iron castings, quarterly certificates of quality will be issued to member companies whose product, as determined by laboratory tests of their daily output, meets the specifications of the institute.

The specifications for certified malleable iron require a minimum ultimate tensile strength of 50,000 lb., a minimum yield point of 30,000 lb. per sq. in., and 10 per cent elongation. These certificates will be certified to by the consulting engineer or the board of directors of the institute. An educational advertising campaign in the trade press to keep the users and prospective users informed of research and trade developments, will be carried on along the same lines as those pursued by the former association.

## Steel Treaters Form New Chapter

Dayton has organized a chapter of the American Society for Steel Treating, with an initial membership of 102, of which 14 are sustaining members. The organization committee, consisting of individuals already members of the society, under the chairmanship of H. H. Skinner, in charge of gas sales Dayton Power & Light Co., held several meetings to discuss the situation and then arranged the first meeting on Thursday evening, March 24. Over 250 members and guests were in attendance at the Dayton Engineering Society's auditorium to hear Frank R. Palmer of the Carpenter Steel Co. present his interesting lecture, "Giving Tool Steels a Chance."

During the preliminary organization a charter was presented to the new chapter and the following officers were elected for the ensuing year: Chairman, G. J. Oswald, research department National Cash Register Co.; vice-chairman, O. Z. Klopsch, engineering department Delco-Light Co.; secretary-treasurer, F. M. Reiter, industrial engineer Dayton Power & Light Co. The members of the executive committee are: E. C. Carter, National Cash Register Co.; H. H. Skinner, in charge of gas sales Dayton Power & Light Co.; R. G. Rogers, foreman of heat treating Delco-Remy Corporation; H. M. Williams, metallurgist Delco-Light Co.; T. J. Mullen, manager in charge of sales City

Machine & Tool Co.; C. E. Merrill, superintendent Gustave Wiedeke Co., and F. T. Sisco, chemist, McCook Field.

The Dayton chapter has scheduled W. S. Bidle, president of W. S. Bidle Co., Cleveland, and past president of the A. S. S. T., as the speaker for the meeting April 18, while Earl C. Smith, assistant general superintendent Central Alloy Steel Corporation, Canton, will be the speaker on May 23. Dayton is the thirty-third section of the society and establishes a record of starting out with the largest number of charter members of any division yet organized.

The membership of the national society at the present time is approximately 4500 and its growth is reported as steady and satisfactory.

## Iron and Steel Group to Meet at Credit Men's Convention

A conference of the iron and steel trade group, numbering about 50 credit department managers of iron and steel manufacturers and wholesalers, will be one of 30 trade group gatherings which will feature the thirty-second annual convention of the National Association of Credit Men at Louisville, Ky., June 6 to 10.

The iron and steel group, under the chairmanship of Herman Hurd, Republic Iron & Steel Co., Youngstown, and the other industry groups will meet Tuesday afternoon, June 7, according to Dr. Frank A. Fall, manager of the education and research department of the association. Doctor Fall, with E. B. Moran, Chicago, manager of the trade group department of the association, is in charge of arrangements for the sessions.

The purposes of the trade groups are to reduce credit losses, to better credit technique and to improve the organization of credit departments. Among the functions of the trade group are the cooperative handling of embarrassed or insolvent estates, the concentration of claims in case of difficulty, the consolidation of ledger experience, and the standardization of terms and discounts.

## Metallurgical Exhibition Being Held by Cleveland Engineers

Metallurgical equipment and materials will be the specialty for the month of April at the continuous exhibit operated by the Cleveland Engineering Society in Cleveland. This is an educational exhibit in which many of the leading manufacturers of the country are displaying their products for the information of engineers, metallurgists and industrial executives of the Cleveland district. The exhibit hall is located on the top floor of Carnegie Hall, adjacent to the club rooms of the society, where many of the local sections of national societies are holding their meetings. The hall is open to the public every day from 8.30 a. m. to 8.30 p. m.

Among the firms which will have displays at the Cleveland exhibit during April are:

Bailey Meter Co.	Gairing Tool Co.
R. E. Bronson Co.	Gardner Tap & Die Co.
Carey Co.	Grasselli Chemical Co.
Case Hardening Service Co.	Lincoln Electric Co.
Chicago Pneumatic Tool Co.	National Tool Co.
Cleveland Hardware Co.	New Haven Sand Blast Co.
Cleveland Tool & Supply Co.	J. M. & L. A. Osborn Co.
Cleveland Twist Drill Co.	C. W. Poe Co.
Commercial Tool Co.	Sandusky Cement Co.
Dahlstrom Metallic Door Co.	Standard Tool Co.
Fraser Sales Corporation	Timken Roller Bearing Co.
	J. C. Ulmer Co.
	Warner & Swasey Co.
	Wellman Bronze Co.
	Wood & Spencer Co.

Several meetings along metallurgical lines will be held in the exhibit hall during April. Among them will be one by the Cleveland Engineering Society, on Tuesday evening, April 12, when a paper on "Corrosion and Its Prevention" will be presented by Clayton M. Hoff, of the Grasselli Chemical Co. Mr. Hoff will deal particularly with the process of cadmium plating and its application in various fields of industry. The local sections of the American Welding Society and the American Society for Steel Treating will cooperate in this meeting.

Another metallurgical meeting will be held in the exhibit hall under the sponsorship of the local section

of the American Society for Steel Treating on Friday, April 22, with the cooperation of the Cleveland Engineering Society. A paper on "Die Blocks and Heavy Forgings," illustrated with motion pictures, will be presented by J. A. Succop, director of research Heppenstall Forge & Knife Co., Pittsburgh.

Special invitations to visit the metallurgical exhibit will be extended to the 400 men who are expected to attend the meeting of the Ohio section of the American Institute of Mining and Metallurgical Engineers, which will be held in Cleveland, April 19.

## Program Arranged for Pittsburgh Safety Engineering Conference

Pittsburgh's Fourth Annual Safety Engineering Conference will be held April 14, at the Chamber of Commerce Auditorium, under the auspices of the Western Pennsylvania Safety Council, with whom are associated the American Society of Safety Engineers, engineering section, National Safety Council, Pennsylvania Department of Labor and Industry, Engineering Society of Western Pennsylvania and other groups.

C. E. Ralston, safety director, Pittsburgh Plate Glass Co., will preside over the morning session which will be opened by R. S. Shoemaker, superintendent of maintenance, American Rolling Mill Co., Middletown, Ohio, speaking on "Electrical Hazards in Industry." Discussion will be led by John James, Carnegie Steel Co., Homestead, Pa., and A. Heckman, Westinghouse Electric & Mfg. Co., East Pittsburgh. "Causes of Crane Accidents" will require two speakers, with Frank Rowe, safety director, Wheeling Steel Corporation, Portsmouth, Ohio, and M. C. Goodspeed, safety engineer, General Electric Co., Erie, Pa., talking respectively on the human and mechanical aspects of the subject. Discussion will be led by Charles Thomas, safety director, American Bridge Co., Ambridge, Pa., and B. Hantman, Westinghouse Electric & Mfg. Co., East Pittsburgh.

The program of the afternoon session, presided over by N. V. B. Ziegler, manager of personnel, U. S. Aluminum Co., New Kensington, Pa., includes "Infection from Lubricants," by George W. Pressell, chief

research engineer, E. F. Houghton & Co., Philadelphia, to be followed by discussion led by Dr. T. A. Little, industrial division, General Electric Co., Erie, Pa. F. G. Bennett, director of safety, Buckeye Steel Castings Co., Columbus, Ohio, will talk on "Foundry Hazards." Pierce Blommers, manager of ventilation department, H. H. Robertson Co., Ambridge, Pa., D. J. Evans, superintendent, Union Steel Castings Co., Pittsburgh, and L. W. Mesta, assistant general superintendent, Mesta Machine Co., Homestead, Pa., will lead discussion. The final feature of this session is a symposium or general round table, discussing "Unusual Accidents—That Can Happen Anywhere." The personnel of this group is as follows: J. A. Northwood, Bethlehem Steel Co., Johnstown, Pa.; J. W. Benner, Carnegie Steel Co., Homestead, Pa.; W. S. Dittmer, Westinghouse Electric & Mfg. Co., East Pittsburgh; A. R. Gray, Peoples Natural Gas Co., Pittsburgh; A. C. Gibson, Prudential Insurance Co., Pittsburgh; John J. Kelley, Iron and Steel Electrical Engineers, Pittsburgh; E. F. Hollibaugh, Pittsburgh Railways Co., Pittsburgh; George McClain, Jones & Laughlin Steel Corporation, Pittsburgh, and Thomas Campbell, Bell Telephone Co., Pittsburgh.

J. A. Oartel, chief of safety bureau, Carnegie Steel Co., Pittsburgh, will be the chairman of the evening session where the first scheduled speech will be that of Dr. A. W. Colcord, Carnegie Steel Co., Clairton, Pa., on "Physical Examination—On Application and Periodic."

## Simplified Sheet Metalware

Tinware and galvanized and japanned ware are covered in Simplified Practice Recommendation No. 55, issued by the United States Bureau of Standards. Copies of the pamphlet may be obtained at 5c. from the Superintendent of Documents, Government Printing Office, Washington. The pamphlet lists in detail a large number of stock items of the various materials and shows the catalog numbers of the items retained on the list. Of 424 items considered, those eliminated numbered 81, or nearly 20 per cent. Of 1154 numbers considered, those eliminated numbered 281, or more than 24 per cent.

## COMING MEETINGS

### April

**American Institute of Mining and Metallurgical Engineers.** April 19 and 20. Spring meeting, Hotel Cleveland, Cleveland. H. Foster Bain, 29 West Thirty-ninth Street, New York, secretary.

**National Metal Trades Association.** April 25 and 26. Annual convention, Hotel Statler, Detroit. J. E. Nyhan, Peoples Gas Building, Chicago, secretary.

**American Welding Society.** April 27 to 29. Annual meeting, Engineering Societies Building, New York. Miss M. M. Kelly, 33 West Thirty-ninth Street, New York, secretary.

**American Electrochemical Society.** April 28 to 30. Annual meeting, Benjamin Franklin Hotel, Philadelphia. Colin G. Fink, Columbia University, New York, secretary.

### May

**American Institute of Mining and Metallurgical Engineers.** May 3 to 5. Open-hearth committee meeting, Hotel Statler, Buffalo. H. Foster Bain, 29 West Thirty-ninth Street, New York, secretary.

**Chamber of Commerce of the United States.** May 3, 4 and 5. Fifteenth annual meeting, Washington.

**American Hardware Manufacturers Association.** May 10 to 14. Spring meeting, Memphis, Tenn. Charles F. Rockwell, 342 Madison Avenue, New York, secretary.

**American Gear Manufacturers Association.** May 12 to 14. Eleventh annual meeting, Hayes Hotel, Jackson, Mich. T. W. Owen, 2443 Prospect Avenue, Cleveland, secretary.

**American Drop Forging Institute.** May 17, 18 and 19. Annual convention, French Lick Springs Hotel, French Lick, Ind. Donald McKaig, 1001 Union Bank Building, Pittsburgh, secretary.

**American Refractories Institute.** May 18 and 19. Spring meeting, Hotel Traymore, Atlantic City, N. J. Dorothy A. Texter, 2202 Oliver Building, Pittsburgh, secretary.

**National Industrial Conference Board.** May 19. Eleventh annual meeting, Hotel Astor, New York.

**American Society for Steel Treating.** May 19 and 20. Sectional meeting, Milwaukee, Wis. W. H. Elsenman, 4600 Prospect Avenue, Cleveland, secretary.

**American Iron and Steel Institute.** May 20. Annual meeting, Hotel Commodore, New York. E. A. S. Clarke, 75 West Street, New York, secretary.

**American Society of Mechanical Engineers.** May 23 to 26. Annual spring meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. Calvin W. Rice, 29 West Thirty-ninth Street, New York, secretary.

**Associated Machine Tool Dealers.** May 25 to 27. National convention, Granville, Ohio. T. W. Carlisle, Strong, Carlisle & Hammond Co., Cleveland, secretary.

**National Foreign Trade Council.** May 25 to 27. Fourteenth annual meeting, Detroit. O. K. Davis, India House, Hanover Square, New York, secretary.

**Society of Industrial Engineers.** May 25 to 27. Fourteenth national convention, Hotel Stevens, Chicago. George C. Dent, 608 South Dearborn Street, Chicago, secretary.



# German Domestic Trade Increasing

Available Steel Supplies Small—French Fuel Cheaper—More European Cartels  
—Poland Asks Large Quotas in Tube and Raw Steel Cartels

(By Cable)

LONDON, ENGLAND, April 4.

**P**IG IRON continues quiet, few consumers being interested at current prices, with makers' order books emptying and reductions in quotations considered inevitable. There are 46 Cleveland furnaces now in blast, 15 of which are producing Cleveland iron, 8 hematite and 23 special grades.

Hematite is still dull and prices weak. The foreign ore market is idle. The domestic price of ferromanganese has been reduced 20s. (\$4.85) per ton and the export market is also about 20s. (\$4.85) per ton easier.

New business in finished iron and steel is quiet in the heavier specifications, but makers are busy on old contracts and some are still many weeks in arrears on deliveries. New ship building contracts are active. The Moor line has placed orders for two 4500 ton

motor ships, with Doxford & Sons. The Clyde output in March was 11 vessels of 31,000 tons.

Tin plate is dull and consumers are showing but little interest in purchasing. Prices are easy despite operation of the reduction of output plan. Makers, however, are confident that buying will develop shortly.

Galvanized sheets are moderately active in small lots. Black sheets are in fair demand, but sales are mostly in the heavy gages.

Continental markets are quiet and prices generally easier as a result of the failure of the International Raw Steel Cartel to establish separate selling agencies on semi-finished steel and beams. No further developments in this connection are expected before the next cartel meeting in May. The International Wire Rod Syndicate has been inaugurated and the price increased to £5 12s. 6d. (\$27.28), f.o.b., but independent mills have sold at £5 3s. (\$24.98), f.o.b.

## German Domestic Market Active—Prices Unchanged for April

(By Radio)

BERLIN, GERMANY, April 4.

**A**PRIL domestic prices are unchanged. The German Raw Steel Syndicate's bounties to exporters are also unchanged, except for universal iron, on which the bounty has been reduced to 16 m. per ton (\$3.80) and wire rods, on which the bounty has been increased to 21.50 m. (\$5.10).

Director Voegler of the United Steel Works has stated that he regards the steel outlook optimistically. Late in March, heavy domestic orders were booked and steel works as a whole have orders for the next three months.

There is a shortage of billets and structural shapes for which there is a heavy demand. Bar demand is more active and delivery terms are lengthening. Demand for sheets from shipbuilders is large, but the

thin sheet market shows less improvement. Wire business is better.

Wire rod production has exceeded the pre-war figure for the first time, in March. Exports of iron and steel in February were 387,302 tons compared with 514,961 tons in January. Machinery exports totaled 29,183 tons against 28,207 tons in January.

## FRENCH BUSINESS STEADY

Lower Fuel Prices May Presage Lower Wages—Domestic Prices Fluctuate

PARIS, FRANCE, March 25.—The general improvement in business that was apparent several weeks ago continues with some fluctuation of demand, domestic business being steady, although small, and export trade limited largely by the higher market, particularly in semi-finished material. Confidence in the financial

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.85 per £ as follows:

	£1	4s.	to £1	2½s.	\$5.82
Durham coke, del'd.	1	2			5.33 to \$5.45
Bilbao Rubio ore†	4	2½			20.00*
Cleveland No. 1 fdy.	4	0			19.40*
Cleveland No. 3 fdy.	3	19			19.15*
Cleveland No. 4 fdy.	3	18½			19.03*
Cleveland No. 4 forge	3	15	to 3	15½	18.18 to 18.30
Cleveland basic	4	5	to 4	6	20.61 to 20.85
East Coast mixed	4	7½	to 4	8½	21.22 to 21.45
East Coast hematite	7	15	to 8	5	37.58 to 40.01
Rails, 60 lb. and up	7	5	to 7	10	35.16 to 36.37
Billets	15	0			72.75
Ferromanganese	15	0			72.75
(export)	15	0			
Sheet and tin plate	6	5	to 6	10	30.31 to 31.52
bars, Welsh	0	19½	to 1	0	4.75 to 4.85
Tin plate, base box	14	5			69.11
Black sheets, Japanese specifications	7	15	to 8	5	1.68 to 1.78
Ship plates	11	0	to 11	10	2.38 to 2.49
Boiler plates	8	10	to 9	0	1.84 to 1.95
Tees	7	15	to 8	5	1.68 to 1.78
Channels	7	10	to 8	0	1.62 to 1.73
Beams	8	5	to 8	15	1.78 to 1.89
Round bars, ¾ to 3 in.	10	10	to 11	0	2.28 to 2.39
Steel hoops	11	5			2.44
Black sheets, 24 gage	15	5	to 15	7½	3.30 to 3.33
Galv. sheets, 24 gage	14	0			3.03
Cold rolled steel strip, 20 gage, nom.					

\*Export price, 6d. (12c.) per ton higher.  
†Ex-ship, Tees, nominal.

## Continental Prices, All F.O.B. Channel Ports (Per Metric Ton)

Foundry pig iron: (a)	£3	9½s.	to £3	10s.	\$16.85 to \$16.97
Belgium	3	9½	to 3	10	16.85 to 16.97
France	3	9½	to 3	10	16.85 to 16.97
Luxemburg	3	9½	to 3	10	16.85 to 16.97
Basic pig iron:					
Belgium	3	5	to 3	15	15.76 to 18.18
France	3	5	to 3	15	15.76 to 18.18
Luxemburg	3	5	to 3	15	15.76 to 18.18
Coke	0	18			4.37
Billets:					
Belgium	4	10			21.82
France	4	10			21.82
Merchant bars:					
Belgium	4	0			1.08
Luxemburg	4	0			1.08
France	4	0			1.08
Joists (beams):					
Belgium	5	0			1.10
Luxemburg	5	0			1.10
France	5	0			1.10
Angles:					
Belgium	5	0			1.10
¼-in. plates:					
Belgium (nominal)	6	8			1.40
Germany (nominal)	6	8			1.40
¾-in. ship plates:					
Belgium	6	1			1.23
Luxemburg	6	1			1.33
Sheets, heavy:					
Belgium	6	3	to 6	4	1.35 to 1.36
Germany	6	3	to 6	4	1.35 to 1.36

(a) Nominal.

structure of the country is stronger than ever and there is plenty of evidence that the present improvement should continue.

Fuel prices have begun to decline and French collieries have decided to apply the lower prices effective April 1, on all shipments made in the second half of March. In making this reduction in coal prices, the operators expect to reduce wages, pointing out that with a general reduction of wages in various industries, the cost of living should also decline. Unemployment in practically all branches of industry, is declining.

**Pig Iron.**—There has been a slight improvement in demand from steel works consumers and although domestic consumption of foundry iron is limited, export business has lately shown an increase. Producers of phosphoric foundry iron have decided to return to the basis of 500 to 510 fr. per ton (\$19.57 to \$19.97) for domestic business, which represents a total price decline of 100 fr. (\$3.92) per ton since Jan. 1. Furnaces have placed 32,000 tons of foundry iron at the disposal of domestic consumers for April. It is claimed by makers that the reduction in fuel costs has already been taken into consideration, so that no further decline in price should be expected, but consumers still hope for a new low level of quotations. The new prices of French coke have not yet been announced, but consumers expect that the reduction will be about 10 fr. per ton (40c.). Negotiations for a new price on German coke are still under way and, with as low as 16 m. per ton being quoted on current business, a reduction in the contract price by the German Coal Syndicate is expected. The price of hematite iron has been reduced and producers have decided to place at consumers' disposal 25,000 tons in April, 10,000 tons for May and

10,000 tons for June. Negotiations continue among hematite iron producers for the extension of the present entente to include export business. Export prices of pig iron are unchanged. The meeting of pig iron producers of France, Belgium and Luxembourg to discuss an international cartel to include Germany, will be held April 7.

**Semi-Finished Material.**—Buyers show no inclination to enter into heavy purchasing, but prices continue firm. The export market is quieter with producers and consumers awaiting further developments. Blooms are quoted at £4 3s. to £4 8s. (\$20.12 to \$21.33) per ton. Billets range from £4 10s. to £4 12s. 6d. (\$21.82 to \$22.42) per ton, depending upon the specifications. Slabs are quoted at £4 16s. to £5 per ton (\$23.27 to \$24.25), all f.o.b. Antwerp.

**Finished Material.**—Activity is limited to small lots for current requirements and occasional purchases to replenish stocks. Beams are quiet at £4 16s. to £4 19s. 6d. per ton (1.06c. to 1.09c. per lb.), f.o.b. Antwerp and bars range from £4 18s. 6d. to £4 19s. 6d. (1.08c. to 1.09c. per lb.) per ton, f.o.b. Antwerp. Rail prices on tonnages for domestic consumption are not strong, although there was a steady rise during the four quarters of last year. Prices on domestic rails advanced from 668 fr. per metric ton in the first quarter of 1926 to 795 fr. in the second quarter, to 875 fr. in the third quarter and to 908 fr. per ton in the fourth quarter. With the new classification of sheets in effect by some plants and the old classification still used by others, it is difficult to determine the current market. The tendency, however, is evidently downward in the domestic field, but steady in export trade.

## MORE EUROPEAN CARTELS

### Mills Make Progress in Eliminating Competition—Tube Makers Agree

HAMBURG, GERMANY, March 19.—Agreements in the European steel industry, eliminating competition among steel producing countries are continuing. Recently manufacturers of fittings and flanges in Germany, Austria and Czechoslovakia have agreed to cease competition for export trade and will, in the future, maintain common selling prices. Markets have been distributed according to the capacities of the various countries participating.

Following a brief period of quiet in the European tube industry, when it was believed that Polish mills were to enter the tube cartel, severe competition has again developed. The proposals of the Polish makers as a basis for their entry into the cartel were found unsatisfactory, as in the case of Polish proposals for participation in the International Raw Steel Cartel, and members of the association are again under-quoting Poland wherever possible. It is claimed that the Polish tube quota would have been 100 per cent in excess of the present capacity. Prices quoted to near eastern and Scandinavian markets have been drastically reduced and these consumers are taking advantage of the temporary low market. In addition to this competition, the large Polish exports to Italy will probably be curtailed following the application of the recently signed agreement of German and Czechoslovakian mills with Italian importers and manufacturers, by which the Italians agree not to import Polish tubes, for which they receive certain compensations.

The Polish steel industry continues to demand an allotment in the steel cartel of 2,000,000 tons a year, although the total production of Poland in February was about 77,000 tons, or at the rate of less than 1,000,000 tons a year. It is argued by the steel cartel that should Poland enter on the basis of 2,000,000 tons quota, Polish producers would for many years receive a substantial income from the \$2 per ton paid by the cartel to members unable to produce to the full extent of their quota.

In Rumania there is a strong effort being made to have Rumanian industry apply for entrance into the International Raw Steel Cartel. The total capacity of

the country is about 320,000 tons a year. It is expected that at the next meeting of the cartel, Rumanian industry will be represented and will ask for membership. Meanwhile negotiations are taking place at Bucharest between German and Rumanian steel interests, which may result in the transfer of certain properties to German control. A few German groups are interested in acquiring certain plants and ore properties in Rumania. These groups, however, insist that the Rumanian government guarantee that taxes and other fiscal charges and regulations be unchanged for the next five years.

At a recent meeting, the European Rail Makers' Association decided that orders taken by the German rail mills and booked to reparations account, should not in every instance be applied against the German quota in the association. However, decision will be made in individual cases as to whether or not they should be charged against the quota or disregarded.

The German Federation of Machinery Manufacturers and similar organizations in other countries are negotiating in Berlin on an agreement to eliminate competition in business with Russia. Satisfactory progress is reported to have been made.

### Stainless Steel Direct from Ore Announced by Swedish Works

HAMBURG, GERMANY, March 19.—It has been announced by the Forsbacka Jernwerks A. B. at Forsbacka, Sweden, that a process for the production of stainless or rust-resisting steel has been developed, by which it is produced directly from ore. The product is claimed to be of good quality and production costs much lower than by the usual processes. The system is known as the Flodin-Gustavson.

German industry is watching with interest the developments in the United States in the production of pig iron direct from the ore, without the blast furnace. Experiments of the National Tube Co. at Lorain, which uses the Hornsey-Wills process, are being watched and if the trials are successful, the introduction of the same or a similar method in Germany is planned. Both the United Steel Works and Friedrich Krupp & Co., are reported to have had some satisfactory results from experiments begun last year.



## EUROPEAN WAGES VARY

### Payments for Skilled and Unskilled Workers in Six Countries Compared

HAMBURG, GERMANY, March 19.—An interesting comparison of wages paid in the different European steel producing countries has recently been made. These wages are comparable only to the cost of living prevailing in the country in which they are paid, but apparently show a wide range of producing costs. It is estimated that in the case of a Czechoslovakian workman, it would require his earnings for 4 years and 3 months to purchase an automobile, the earnings of 3½ weeks for the purchase of a medium quality suit and the earnings of 9 years and 9 months for a single-family home. The following comparison in dollars is on the basis of a 46-hr. week:

Position	Wages Per 46-Hr. Week					
	Germany	Poland	Czechoslovakia	Austria	Sweden	Belgium
Unskilled worker...	\$9.50	\$6.10	\$4.10	\$5.00	\$10.75	\$6.20
Unskilled worker for more than 5 years	10.75	6.50	5.25	6.00	11.50	7.10
Skilled worker....	12.50	7.10	5.90	6.75	14.00	10.00
Steel mill roller....	13.75	7.10	6.30	6.90	15.75	10.30
Steel wire drawer...	13.00	6.80	5.80	6.20	15.10	10.00
Transport worker...	9.75	5.75	4.70	5.40	11.50	7.00
Skilled bolt maker...	13.75	7.00	5.10	6.90	16.00	9.80
Foreman of tube mill	14.75	8.00	6.50	7.35	17.50	11.50

This comparison was compiled from the average of wages paid on Jan. 1, of this year. The wages paid to French steel workers are slightly lower than the Belgian wage level. The rate in Holland is slightly lower than in Germany. Italian wages are at about the same level as the Belgian, and Russian wages are about 20 per cent lower than Czechoslovakian. British wages vary from \$14 to \$16 a week.

## CHINA TRADE GOOD IN 1926

### Imports Showed Small Increase But War Curtailed Business—Japan Offered Sheets

SHANGHAI, CHINA, March 1.—Although customs statistics for 1926 show an increase in the volume of metal imports by Shanghai and other Chinese ports, the year was not particularly prosperous, for the increased turnover was on a small margin of profit and at considerable risk, as a result of the sharp decline in exchange. An added impetus to purchasing was given by the tariff conference at Peking, at which time there was speculation in metals and other products, based on the belief that a surtax would be levied.

According to the customs returns Shanghai imported more metal products than in 1925. Statistics for the first nine months of 1926 show a total importation of 1,932,553 piculs (115,177 gross tons) compared with 658,468 piculs (39,244 tons) in the same period of 1925. Hankow also imported on a larger scale than in 1925, but the total was smaller than in 1924. The past year was also larger in the case of Tientsin, which imported 469,171 piculs (27,917 tons) in 1926, compared with 463,631 piculs (27,632 tons) in 1925. These are the three principal Chinese ports. The treaty port of Amoy, which reports for the first nine months of 1926, as in the case of Shanghai, also shows increased imports of iron and steel in 1926.

Business during the year might have been better but for increased war activities in the second half. Shanghai continued purchasing the usual volume, but business from interior points was stopped during the heavy fighting about Hankow. In the summer of last year, preparations for war in the Yangtze Valley, caused curtailment of buying by merchants in this territory and since then purchasing has been only for immediate requirements and recently, even this small tonnage of business, has been stopped by the fighting. As Shanghai merchants were well-stocked with bamboo steel, tubes, etc., there has been little demand for further importation.

Demand for tin plate, particularly from Amoy, has been growing as a result of increased requirements of the canning industry at Amoy. Imports of tin plate by Amoy totaled about 376 tons in 1923, 386 tons in 1924, 403 tons in 1925 and 450 tons is the estimated total for 1926. The United States was the principal

source of supply, about 50 per cent being purchased direct and the rest through dealers at Shanghai, Manila and Hongkong.

Throughout 1926 there was a good demand for tin plate waste waste for various manufacturing purposes. Galvanized sheets, however, were one of the most active products and a feature of this market was the entry of Japanese sellers into the Chinese market with Japanese galvanized sheets of No. 32 gage, 48 sheets to the bundle of 532 lb. at prices considerably below the British or American quotations on similar material. As a result importations of galvanized sheets from Japan were large last year, but, while first reports were that the galvanizing was of a good grade, lately there have been increasing complaints from consumers.

## JAPAN BUYS TIN PLATE

### Oil Company Places Quarterly Needs—Chinese Merchants Continue Inquiries

NEW YORK, April 5.—A small but fairly steady volume of inquiry continues from Japan, but business is confined to the large consumers, such as oil companies, railroads, municipalities and public utilities. Despite the war conditions in China, which have seriously curtailed trade with the interior, inquiries for small lots of material continue to appear from Shanghai and Canton. The price ideas of Chinese merchants, however, are in many instances too low to permit of business. Recently there have been several offers from Shanghai to purchase galvanized wire shorts at \$32 per ton, c.i.f. Shanghai, and, although a few shipments have been made at low prices, sellers as a rule are not inclined to take orders on this basis.

Of the recent Japanese inquiries in the market, an outstanding one, the 26,750 base boxes of oil can tin plate for the Nippon Oil Co., has been doubled and awarded to three Japanese exporters. The 53,500 base boxes will probably go to mills in the United States, but purchase has not yet been made by the exporters. Still pending are several small lots of tin plate consisting of a few hundred boxes each.

Two inquiries for gas pipe, which have been before the market for several weeks, have finally been awarded to exporters and placed with American makers. The Tokio Gas Co. has closed on 1,450,000 ft. (877 tons) of gas pipe. The Imperial Government Railways, which originally asked for prices on 90,000 metres of gas pipe has awarded only 45,000 metres, to be furnished by an American maker.

In railroad business the 20,000 tie plates for 100-lb. rails asked for by the Chosen State Railways are still pending. The rails for Nagoya municipality, 5 miles of 91-lb. high T-rails, originally reported as going to a Continental mill, have been placed in the United States.

Importers of European steel for the United States report a slight improvement in demand from American consumers, but orders are still small. Prices of the continental product are stronger and, except on sizable business, 1.75c. per lb. base on plain steel bars is about the minimum, with reinforcing bars at about 1.85c. per lb. Much of the current business is still being placed by the importers with Belgian, French and Luxemburg mills, to avoid possible charges, should action be taken against German products under the anti-dumping act.

## Steel Co. of Canada Now Making Galvanized Sheets

The Steel Co. of Canada, Ltd., Hamilton, Ont., has definitely announced that the new mill to produce galvanized sheets will be completed and in operation by May 1, next. The company has for some years been producing black and blue annealed sheets, and with the opening of the new plant will be producing galvanized sheets through every process from the ore to the finished product. A complete range of sizes and gages will be made and the sheets will be known as "Stelco" galvanized sheets. The company is now taking orders for the new sheets for May and June delivery. The making of galvanized sheets represents another addition to the large family of products turned out by the Steel Co. of Canada.

# Machinery Exports Hold Up Well

Total of \$1,056,257 a Day in February Against \$1,078,498 a Day in January—Imports Have Continued Heavy for 15 Months

WASHINGTON, April 2.—Exports of all kinds of machinery in February were valued at \$29,575,096, against \$33,433,429 in January, the smaller showing for February being accounted for by the fact that it is the shortest month of the year. With the Department of Commerce shifting its figures to the calendar year basis, its latest data show exports and imports for the two months ended February. For this period of 1927 exports of machinery were valued at \$63,008,525, against \$66,856,454 for the corresponding period of 1926.

The Division of Statistics' classification for industrial machinery being broader than that of the Industrial Machinery Division, the former carries larger figures, placing exports of this type of equipment at \$13,754,475 for February and \$31,319,262 for the two months ended February, while in January the exports were valued at \$17,564,787. Exports of industrial machinery as classified by the Industrial Machinery Division, valued at \$12,275,000 in February, 1927, showed an increase of more than \$1,225,000 over shipments in the corresponding month of 1926. This division prepared the chart, indicating the monthly export experience of the United States since 1922, the year following the collapse of the post-war export expansion.

Exports of power-driven metal-working machinery in February number 537 items, valued at \$745,646, against 628, valued at \$754,515 in January. In the total list of metal-working machinery \$1,121,256 was sent abroad in February, compared with \$1,495,455 in January.

Imports of machinery as listed in THE IRON AGE table were valued at \$1,483,713 in February, against \$1,640,177 (revised) in January. For the two months ended February they were valued at \$3,123,990, compared with \$3,234,928 for the corresponding period of last year. Imports of industrial machinery as classified by the Division of Statistics were valued at \$1,324,521 in February and at \$2,748,363 for the two months ended Feb. 28. For February of last year they were valued at \$996,317 and for the two-month period at \$2,732,807.

## Movements of Specified Items

Exports of mining and quarrying machinery in February showed an increase of more than \$100,000 over the corresponding month of last year. The most important gains in this group were made in coal cutters and rock drills, the former increasing from \$16,699 to \$112,519 and the latter from \$99,078 to \$149,098. The oil-well machinery group increased to \$1,435,047 from \$1,

## Exports of Power-Driven Metal-Working Machinery

	February, 1927		January, 1927	
	No.	Value	No.	Value
Engine lathes.....	53	\$87,896	36	\$116,374
Turret lathes.....	21	61,178	8	14,354
Other lathes.....	56	98,368	21	53,619
Vertical boring mills and chucking machines.....	16	31,141	9	24,725
Thread-cutting and automatic screw machines.....	56	80,891	84	78,244
Knee and column-type milling machines....	30	52,459	26	42,206
Other milling machines	21	23,979	28	65,908
Gear-cutting machines	7	13,518	21	34,327
Vertical drilling machines.....	35	25,520	23	20,304
Radial drilling machines	3	7,377	7	17,896
Sensitive drilling machines.....	40	7,394	31	2,660
Other drilling machines	49	20,630	25	9,435
Shapers and slotters...	10	10,783	38	50,801
Planers.....	7	32,448	3	1,839
External cylindrical grinding machines...	38	82,019	171	139,851
Internal grinding machines.....	29	59,248	21	52,882
Metal-working tool-sharpening machines.	66	50,797	76	29,090
Total.....	537	\$745,646	628	\$754,515

## Imports of Machinery into the United States

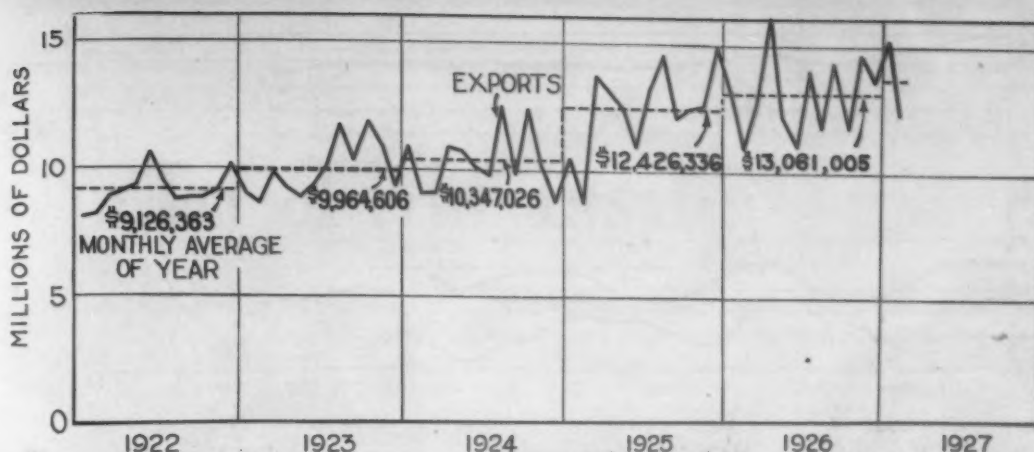
	February		Two Months Ended February	
	1927	1926	1927	1926
Metal-working machine tools.....	\$31,743	\$41,918	\$65,313	\$83,942
Agricultural machinery and implements.....	535,083	486,453	871,127	724,998
Electrical machinery and apparatus.....	142,879	143,646	394,391	307,767
Other power-generating machinery.....	2,568	.....	19,389	1,110
Other machinery.....	624,383	625,327	1,475,110	1,757,044
Automobiles and other vehicles, except agricultural.....	147,057	179,254	298,660	360,067
Total.....	\$1,483,713	\$1,476,598	\$3,123,990	\$3,234,928

## Machinery Exports from the United States

	(By Value)		Two Months Ended	
	February, 1927	February, 1926	February, 1927	February, 1926
Locomotives.....	\$63,326	\$820,952	\$1,195,953	\$1,727,710
Other Steam Engines.....	53,349	111,139	338,422	201,616
Boilers.....	145,503	112,674	416,655	298,016
Accessories and Parts.....	40,904	78,062	73,731	140,025
Automobile Engines.....	1,098,184	1,221,489	1,776,183	2,170,272
Other Internal Combustion Engines.....	355,287	548,502	902,124	857,416
Accessories and Parts.....	352,961	276,627	697,493	547,169
Electric Locomotives.....	50,059	477,485	63,903	563,333
Other Electric Machinery and Apparatus.....	624,639	422,233	1,353,850	1,065,036
Excavating Machinery.....	305,982	360,205	630,969	653,987
Concrete Mixers.....	83,677	96,418	194,177	124,153
Road-Making Machinery.....	78,143	156,972	190,495	275,706
Elevators and Elevator Machinery.....	419,210	206,051	760,961	844,858
Mining and Quarrying Machinery.....	1,069,586	962,153	2,206,805	2,473,793
Oil-Well Machinery.....	1,435,047	1,023,205	3,412,662	1,850,063
Pumps.....	443,872	564,809	1,038,940	1,083,219
Lathes.....	247,442	176,109	431,789	381,169
Boring and Drilling Machines.....	76,544	27,022	150,397	58,209
Planers, Shapers and Slotters.....	43,231	13,653	95,871	39,235
Bending and Power Presses.....	50,280	20,213	156,068	137,533
Gear Cutters.....	15,518	49,368	47,845	63,103
Milling Machines.....	75,438	58,686	184,552	139,095
Thread-Cutting and Screw Machines.....	80,891	44,972	159,135	99,880
Forging Machinery.....	50,430	80,913	156,305	152,491
Sharpening and Grinding Machines.....	235,988	181,658	484,103	426,993
Other Metal-Working Machinery and Parts.....	284,886	318,503	636,961	769,291
Textile Machinery.....	721,241	823,883	1,746,443	2,079,738
Sewing Machines.....	724,706	758,959	1,498,187	1,280,749
Shoe Machinery.....	100,795	99,026	173,635	211,051
Flour-Mill and Gristmill Machinery.....	20,193	56,559	36,841	43,226
Sugar-mill Machinery.....	284,998	217,449	449,658	421,533
Paper and Pulp-Mill Machinery.....	573,155	168,520	1,159,066	430,972
Sawmill Machinery.....	58,853	95,719	137,854	157,123
Other Woodworking Machinery.....	80,115	105,646	193,570	220,908
Refrigerating and Ice-Making Machinery.....	305,330	118,595	706,461	256,363
Air Compressors.....	399,153	332,890	732,118	724,295
Typewriters.....	1,589,383	1,483,144	3,240,481	3,278,792
Power Laundry Machinery.....	177,815	112,255	257,911	212,874
Typesetting Machines.....	204,307	286,435	527,940	648,347
Printing Presses.....	613,469	852,738	1,084,474	1,563,881
Agricultural Machinery and Implements.....	5,487,161	8,731,883	10,118,660	17,165,823
All Other Machinery and Parts.....	10,455,545	9,643,367	23,189,850	21,018,713
Total.....	\$29,575,096	\$32,276,115	\$63,008,525	\$66,856,454



Machinery Exports from the United States Have Shown a Steady Upward Trend, in Spite of Wide Fluctuations in the Month by Month Totals



\$23,205, well drilling machinery rising to \$649,895, while shipments of other oil-well machinery increased from \$523,915 to \$785,152. Decreases were shown in shipments of constructors' conveying machinery and of textile, sewing and shoe machinery, the former group dropping by approximately \$93,000 and the latter by \$135,000. A noteworthy fluctuation in the textile machinery group was a decrease in exports of cotton spinning and twisting machinery from \$121,178 to \$10,386. Exports of looms, on the other hand, increased from \$30,678 to \$70,000, and wool carding and weaving machinery from \$16,458 to \$35,822.

Nine steam locomotives exported in February were valued at \$63,326; for the two months there were 50, valued at \$1,195,953, showing a wide fluctuation. In February Canada took three locomotives, valued at \$20,988, and for the two months 10, valued at \$38,327, were shipped to that country. Mexico took three, valued at \$27,608, in February and five, valued at \$42,740, during the two months. South American countries, aside from Brazil and Chile, took two locomotives, valued at \$4,980, in February and 22, valued at \$782,980, during the two months. Of the sewing machines exported in February, 4647, valued at \$283,982, were for industrial use; for the two months these shipments represented 8241 machines, valued at \$518,677.

Harvesters and binders to the number of 2250,

#### United States Exports and Imports of Machinery

	Exports of Machinery	Imports of Machinery	Exports of Power-Driven Metal-Working Machinery
The year 1924...	\$317,040,424	\$9,711,618	\$8,644,444
1925			
January .....	28,117,952	803,829	845,986
February .....	23,215,776	814,703	707,445
March .....	33,932,473	999,237	1,364,930
April .....	33,468,086	1,167,099	1,694,761
May .....	32,164,865	861,655	1,230,914
June .....	27,121,123	935,487	1,003,325
Fiscal year .....	325,578,294	10,404,337	14,011,404
July .....	32,320,533	905,872	1,188,069
August .....	38,768,823	747,912	1,308,372
September .....	30,719,342	956,250	989,379
October .....	31,271,007	996,557	905,826
November .....	30,084,814	876,113	1,007,376
December .....	37,933,511	1,448,316	1,155,660
The year 1925...	385,376,676	11,577,911	13,052,916
1926			
January .....	34,590,693	1,659,971	1,206,125
February .....	32,269,707	1,469,170	1,294,934
March .....	35,241,960	1,567,912	1,297,616
April .....	38,755,467	1,814,021	1,479,337
May .....	32,707,863	1,494,156	1,004,298
June .....	30,498,054	1,484,127	1,024,252
Fiscal year .....	398,306,436	15,413,144	16,046,267
July .....	34,123,992	1,327,874	1,318,556
August .....	32,459,844	1,453,909	1,326,443
September .....	36,901,003	1,432,378	1,145,406
October .....	27,965,148	1,247,115	1,069,343
November .....	32,694,793	1,210,868	1,274,446
December .....	32,140,569	1,373,234	1,202,069
The year 1926...	400,167,883	17,137,056	14,315,895
1927			
January .....	33,433,429	1,640,177	1,495,455
February .....	29,575,096	1,483,713	1,121,256
Eight months...	259,017,589	11,172,967	9,953,088
Two months...	63,008,525	3,123,990	2,616,711

valued at \$409,043, were shipped abroad in February and for the two months the number was 3104, valued at \$566,410. Shipments by principal countries for February and the two months, respectively, included the following: Italy, 512, valued at \$90,636, and 532, valued at \$94,146; France, 389, valued at \$60,660, and 455, valued at \$67,824; Belgium, 200, valued at \$36,595, and 220, valued at \$40,002; Spain, 288, valued at \$46,946, and 404, valued at \$66,947; and United Kingdom, 187, valued at \$31,317, against none in January.

## BRITISH MANUFACTURES

### Census of 1924 Industry Now Being Made Public—Value of Iron and Steel Products

GREAT BRITAIN is now publishing the first results of the census of production for 1924. Some of the items relating to the iron and steel industry, as given in *Economist*, London, are detailed below. In the output figures comparison is made with 1907, when a previous manufacturing census was undertaken.

Table I—Iron and Steel Production in Great Britain

	Production, 1924		Production, 1907	
	Gross Tons (a)	£ (a)	Gross Tons (a)	£ (a)
Steel blooms, billets and slabs...	1,056	9,005	525	3,021
Steel sheet and tin plate bars...	1,876	15,079	991	5,308
Other steel bars, rods, etc....	1,269	13,761	974	7,271
Iron bars, rods, angles, etc....	350	4,465	837	6,148
Steel rails .....	534	4,592	733	4,372
Other railroad material .....	479	7,967	532	5,604
Hoops and strips .....	415	4,826	389	3,034
Galvanized sheets .....	696	12,682	297	3,991
Plates and other sheets .....	1,793	22,154	1,579	13,291
Cast iron pipe and fittings...	414	4,340	331	1,920
Iron castings .....	483	8,459	924	7,379
Other tonnage products .....	2,626	22,581	1,212	9,257
Other products .....	...	18,712	...	10,087
Total values .....		149,622		80,583

(a) Thousands.

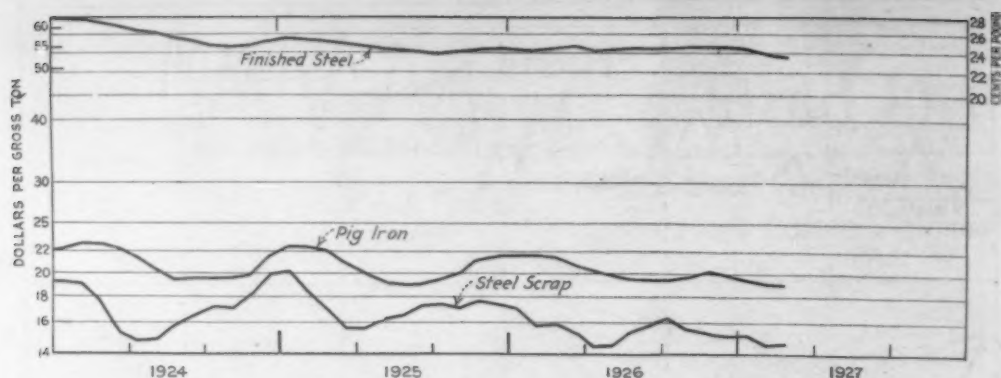
Table II—Manufacture of Iron and Steel in Great Britain

	Value of Output £ (a)	Cost of Material £ (a)	Number of Employees	Net Output per Person Employed	Total Horse-power
Pig iron .....	36,359	31,217	26,843	£193	441,165
Smelting, rolling and founding .....	149,622	105,447	218,310	202	1,355,013
Steel and wrought iron tubes .....	13,446	8,201	24,275	216	25,562
Tin plate .....	22,539	16,185	28,024	227	101,515

(a) Thousands.

The Copper & Brass Research Association announces that the Wolverine Tube Co., Detroit, manufacturer of seamless brass and copper tubing, has become a member of the association.

The Corrigan-McKinney Steel Co., Cleveland, employing 2800 men, recently operated all of its departments for 30 days without a lost time accident.



Scrap Prices Have Shown the Same Downward Tendency as That of Pig Iron and Finished Steel. All are in keeping with the gradual decline of commodity prices in general

## SCRAP PRICES AT LOW LEVEL

### Pig Iron and Finished Steel Also Lower Than for Some Years

AVERAGE prices of heavy melting steel scrap at Chicago, Pittsburgh and Philadelphia reached a lower level in February than at any time since last June, and recovered only very slightly in March. As shown in the table, the March average of \$14.65 was only ½ per cent higher than the \$14.58 in February. The decline began in September, which was the highest month in more than a year.

While pig iron has stiffened a little in the past few weeks, it still is lower on the monthly average basis than it has been in nearly two years. March showed the low level of \$19.03 a gross ton, compared with \$19.07 in February and with \$21.65 in March of last year. The peaks and hollows of its curve do not by any means coincide with those of scrap.

Finished steel, which had maintained a fairly uniform price all through 1926, has shown a declining tendency since then, with March at the lowest level in about five years. This was 2.367c. a lb., compared with 2.378c. a lb. in February and 2.433c. a lb. in March, 1926. As has often been noted, the fluctuations in the finished product are much less violent than those in the partly finished (pig iron) and in raw materials such as steel scrap.

Both by diagram and in the table, the three com-

### Composite Prices on Iron and Steel Products

	Steel Scrap	Pig Iron	Finished Steel, Per Lb.
January, 1925.....	\$20.10	\$22.44	2.560c.
February .....	18.27	22.50	2.546c.
March .....	16.92	21.99	2.537c.
April .....	15.48	20.95	2.503c.
May .....	15.46	19.85	2.460c.
June .....	16.09	19.22	2.440c.
July .....	16.46	18.96	2.435c.
August .....	17.23	19.01	2.413c.
September .....	17.42	19.38	2.397c.
October .....	17.08	19.92	2.405c.
November .....	17.63	21.17	2.433c.
December .....	17.37	21.54	2.450c.
Year's average...	17.12	20.58	2.465c.
January, 1926.....	16.97	21.79	2.447c.
February .....	15.50	21.77	2.428c.
March .....	15.83	21.65	2.433c.
April .....	15.27	20.96	2.439c.
May .....	14.35	20.69	2.416c.
June .....	14.40	20.00	2.420c.
July .....	15.42	19.51	2.431c.
August .....	15.88	19.46	2.431c.
September .....	16.25	19.46	2.439c.
October .....	15.58	19.69	2.449c.
November .....	15.25	20.13	2.453c.
December .....	15.08	19.94	2.453c.
Year's average...	15.48	20.42	2.439c.
January, 1927.....	15.17	19.44	2.432c.
February .....	14.58	19.07	2.378c.
March .....	14.65	19.03	2.367c.

posite prices are shown. The table covers 27 months, while the diagram traces the history of these movements from the beginning of 1924.

## How Iron and Steel Dominates Pittsburgh

Wage earners in the iron and steel and allied industries represent 52.2 per cent of the total wage earners in industrial enterprises in Allegheny County, Pa., of which Pittsburgh is the county seat. These figures are given in a survey made by Dr. Joseph L. Gillman, director of the Bureau of Business Research of the University of Pittsburgh, and published in Business Barometer No. 1 of that institution. The number of wage earners is given as 100,925, out of a total for all industries of 192,583. The other leading industries, in order, included mines and quarries, building and contracting, electrical equipment, food and kindred products, etc.

Iron and steel workers in the district were paid better than was the case with the rest of the wage earners. This is shown through the fact that their total wages represented 58.8 per cent of all industrial wages for the district, the amount having been \$171,034,000, or an average of \$1,695 per head. This compares with \$120,070,000, or an average of \$1,310 per head, for the other industries. (The figures are averages for the three years, 1919 to 1921 inclusive.)

Capital invested represented \$474,639,000, or 52.2 per cent of the total capital in all the industries of the district. This percentage is precisely the same as that for the number of wage earners. In value of product, however, the iron and steel industry went far beyond its ratio as shown for other items. It was 65.5 per cent of the total, represented by \$1,189,485,000, out of a total of \$1,816,650,000.

## Increase in Iron and Steel Employment

A gain of 1.5 per cent in the number on the payroll in 210 identical iron and steel establishments is shown in February, compared with January. Figures of the United States Bureau of Labor Statistics give 272,041 employees in the earlier month and 276,194 in the later. The advance in wages was even greater, reaching 6.3 per cent. The amount of payroll for one week in January was \$8,062,258. In February, this had increased to \$8,566,928. Evidently the average pay envelope was better filled to the extent of about 4.8 per cent.

## Reduced Electric Production

February production of electric power by public utility power plants in the United States is reported by the Geological Survey at 6086 millions of kwhr. This compares with 6729 in January and 6816 in December. Because of the shorter month, February showed a very slight gain in daily production over January. Both, however, were below that reached in December. More than 36 per cent of the February output was generated by water-power.

The number of electric hoists ordered in February increased 2.67 per cent over the previous month, and the value increased 10.7 per cent, according to the Electric Hoist Manufacturers' Association, 165 Broadway, New York. Shipments were 8.6 per cent less.



# In This Issue

*Suggests consolidations as a partial remedy for problems confronting gray iron foundry industry.—Surplus capacity might also be reduced by disposing of foundry properties to other lines of industry. Business lost by jobbing industry from competition of foundry departments might be lessened by a joint educational campaign.—Page 1001.*

*Setting twist drills at a helix angle of 32 to 35 deg. generally gives best results in gray iron and cast steel, investigators report.—Power consumption decreases at the drill point as the helix angle is increased from 15 deg. and drill endurance increases.—Page 1006.*

*Aircraft builders find low-carbon chrome-vanadium sheet steel excellent material for airplane fittings.—It may be welded and formed easily. Sheets must have balanced physical properties, parallel and perpendicular to the length of the sheet.—Page 988.*

*Reduces chromium losses in making stainless iron by melting ferrochromium separately.—A special electric furnace is used. The soft iron bath is produced in an ordinary steel furnace.—Page 991.*

*Lead coating applied to steel by new process will melt before it will part from its base.—Will withstand a temperature 50 deg. higher than sheet lead, without peeling, cracking, or blistering, and can be crimped, beaded or rolled without damage to the coating.—Page 1041.*

*Is the sulphur content of iron reduced by adding fluorspar in the cupola?—Yes, report German investigators, if the limestone used is not pure. Tests reveal that adding fluorspar in the cupola may be useless and even harmful when a very pure limestone is used.—Page 997.*

*Jobbing foundry with a payroll of only 125 persons made a profit of \$220,000 last year.—Nearly all work, even pouring and shipping, is on a piece-work basis. Supervision expense is held to a minimum.—Page 1002.*

*Foreign customers bought less of our machinery this February than last.—Shipments were valued at 29.5 million dollars, which was 3 millions under the February, 1926, total.—Page 1012.*

*State agricultural department seeks to break down wall between farmer and manufacturer by an educational campaign.—A book on Wisconsin industry acquaints farmers with businesses of the manufacturers whose success means a greater market for Wisconsin farm products.—Page 999.*

*Favorable geographical position makes Belgium a powerful factor in world steel trade.—All hauls of raw and finished materials are relatively short and inexpensive, owing to well-developed waterways and light railroads. Labor is cheap and plentiful. Destruction of mills by Germans was economically a blessing, as modern low-cost plants have been built.—Page 994.*

*March pig iron output largest since April, 1926.—Daily production averaged 112,366 gross tons, a gain of 7 per cent over previous month. The number of furnaces in blast April 1 was 223, which was 6 more than on March 1.—Page 1022.*

*In obtaining desirable apprentices, educating the parents in the value of a trade is an important factor.—The boy himself has no notion of what he wants to do. Both he and his parents must be induced to think of what the boy can do and where he should do it, says director of training.—Page 992.*

*Traveling coal towers can each unload 350 tons of coal per hour.—Will be used to unload 10,000-ton ocean-going colliers supplying coal for New York Edison Co. generating station.—Page 998.*

*Skilled workers in Austria are paid about \$6.75 per week.—Of six European countries, Sweden pays the highest wage to skilled labor, \$14 per week.—Page 1011.*

*Confusion arises out of Commerce Commission's ruling on scrap freight rates.—Unless machinery purchased for scrapping is reduced to fragments it cannot be shipped under scrap rates. Dealers, consumers and railroads meet to clarify the situation.—Page 1040.*

*Iron and steel industry is indifferent to coal strike.—Fuel stocks are large, and maintenance of non-union output reassures consumers. But if non-union miners go out in sufficient number to affect production, the strike will take a different aspect.—Page 1017.*

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## On Broad as Well as Intimate Problems of Industry

**W**E have recounted on this page at different times some of the outstanding achievements of THE IRON AGE in the way of securing authoritative contributions on developments in metallurgy and metal working. In cases the subjects have been an absolutely new unfolding, and in others they have represented priority in bringing the literature up to date. All of which is mentioned to fortify readers, if that were necessary, in their dependence on the sufficiency of THE IRON AGE.

We continue to find a favorable response to our editorials discussing broad economic questions. In its upward of 72 years of service, this journal has spoken on the bearing of movements in finance, politics and industry, but it is in the years since the world war that the horizon has greatly widened for business. And along with the multiplying of the problems of industry has come the increased demand on THE IRON AGE for interpretation.

*For News Summary See Reverse Side*



# Coal Strike Has Quiet Start

Union Mines Generally Idle But Coal Is Being Produced in Non-Union Districts, Which Are Admittedly Pivotal

PITTSBURGH, April 5.—Little outward evidence exists here of the strike of the union soft coal miners growing out of the failure of the mine operators and the United Mine Workers of America to agree upon a new wage scale with the expiration of the agreement last Thursday. Western Pennsylvania mines which have been operated under an agreement with the miners' union generally suspended operations last Wednesday or Thursday, and no effort is being made to operate any of them, although the Pittsburgh Terminal Coal Co. went so far as to post a new scale calling for wages approximately the same as now are paid by the Pittsburgh Coal Co., which almost two years ago broke away from the union and since August, 1925, has been operating on an open-shop basis.

The men in the Pittsburgh Terminal mines have not responded to the offer and no effort yet has been made to start up, although the company previously had let it become known that it intended to start operations without recognition of the union as of April 1.

## Position of Pittsburgh Coal Co.

Some 800 men employed at the mines of the Pittsburgh Coal Co. in the Pittsburgh district failed to report for work on April 1, but defection was regarded as natural in view of the fact that it was Mitchell Day, a coal mine holiday observed as an anniversary of the inauguration of the 8-hr. day in the coal industry achieved when John Mitchell was president of the miners' union. The number of men working in the company's mines since has worked back to within a few hundred of the total of March 31.

This showing is encouraging to those who believe the union will lose in this struggle, because it has been commonly believed that this company and one or two others which left the ranks of union mines since the adoption of the agreement in Jacksonville in February, 1924, would be the special object of union activity. The union is picketing the mines of this company but apparently without success in getting the men to walk out.

Actually union success has been greater elsewhere, notably in the Scotts Run district in northern West Virginia just south of the lower Connellsville district and north of the Fairmont district. The union reports a complete shutdown in that district with 11,000 men out, but this appears to be an exaggeration, as the more reliable and impartial railroad reports indicate that about one-third of the mines there still are operating.

## Production Proceeding in Connellsville Region

No disturbance has developed in the Connellsville district, where production of both coal and coke, if anything, is increasing, as the H. C. Frick Coke Co. is preparing to start more than 800 additional coke ovens, which means additional coal production to supply them. Full operation of the non-union mines north and northeast of Butler, Pa., is reported but south of Butler into Pittsburgh, where the mines are all union operations, there has been a complete shutdown.

There seems to be a complete indifference in the iron and steel industry over the strike and its possibilities in respect to future supplies of soft coal. Almost no demand exists for pig iron and little of the demand for steel products can be ascribed to fears as to the coal strike eventualities. The struggle is start-

ing quietly but such was to be expected in view of the preparations made for it by consumers in the way of stocks. The large stocks and the maintenance of non-union output give a measure of assurance to consumers, but at the same time the labor situation in the non-union districts is being watched closely for developments, as it is generally admitted that if the union is successful in getting the non-union miners to quit in sufficient numbers to affect production, the strike will take a different aspect.

Stocks of coal are large only when taken in conjunction with the available supply of non-union coal. If there was such a condition that consumers had to depend entirely upon their stocks, they would not last more than two to four months, and it is estimated that more than half of the stocks are steam grade as distinct from the coking and gas grades commonly used by the iron and steel industry. The outcome of this strike will be largely determined by the maintenance or non-maintenance of non-union production.

## Reductions in Tin Plate and Sheet Production in Mahoning Valley

YOUNGSTOWN, April 5.—Spotty conditions mark iron and steel production schedules this week in the Mahoning Valley, with considerable easing in tin plate output. Both of the leading independent tin plate producers, the Trumbull Steel Co. and the Youngstown Sheet & Tube Co., report a decline in tin plate production.

Non-integrated sheet rollers, likewise, report a decline in production, with the Waddell Steel Co. and the Falcon Steel Co. idle. On the other hand, demand for full-finished sheets is well sustained and such interests as the Newton Steel Co. have built up backlogs, in face of a capacity operating rate. The Newton company has all 20 of its mills at Newton Falls under power. This week, in the Valley, but 101 sheet mills are scheduled, against 113 the preceding week.

Production of strip steel, especially hot-rolled, continues at a high rate, and the strip departments of both the Trumbull company and the Sharon Steel Hoop Co. are running full.

The Sharpsville Furnace Co. started this week its merchant blast furnace at Sharpsville, Pa., which has been idle since Jan. 8 for repairs.

Schedules for the Valley show 44 open-hearth furnaces active out of 53 independent units, and 14 open-hearth furnaces of the Carnegie Steel Co., a total of 58 out of 69.

With most Valley primary steel producers, March shipments exceeded figures for the corresponding 1926 period, but earnings will likely be less by reason of lower prices prevailing.

March established a new record for the Trumbull Steel Co. for any monthly period, for production and shipments.

Steel plates in this area are quoted down to 1.80c. per lb., though the ruling price, even on small lots, is 1.85c. This compares with previous quotations of 1.90c. which have ruled for some time. The general impression in this district is that prices do not have behind them the sustaining influences necessary to create a firm market.

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*Schedule of the next installments of the Business Analysis and Forecast, by Dr. Lewis H. Haney, Director, New York University Bureau of Business Research, follows: April 14—Activity in Steel Consuming Industries; April 21—Position of Iron and Steel Producers; April 28—General Business Outlook.*

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## Excess Producing Capacity

IT is an economic axiom that the prosperity of a people arises out of production; that it is impossible for a people to produce too much. This is theoretically true. Nevertheless, every mercantile man knows that it is not only possible to produce too much of some one thing but also that this happens too frequently for commercial comfort. At the present time the United States is clearly producing too much of many things.

Generalizing, we may say that there is a superfluity of the main foodstuffs, fibers, fuels, and many of the metals. More particularly there is excessive production of cotton and woolen goods, of wheat, corn and meat, of copper and zinc, of coal and petroleum. The markets that are really strong are few. Tin is one, owing to international scarcity. Rayon, after having a black year, is now advancing. Iron and steel and brimstone are fairly firm. It is hard to think of other major commodities whereof producers can be optimistic.

In regard to nearly all of these commodities the explanation is excessive producing capacity. The desire to make use of the maximum thereof that is possible reduces prices and contracts margins of profit. The reduction in wholesale prices is more than in retail. Merchandisers, therefore, profit at the expense of producers, but nevertheless the public enjoys cheaper prices and will do so even more if maladjustment becomes prolonged.

Maladjustment in fact expresses the reason for trouble. We do not produce too much in the aggregate, and never can, but we do produce too much of many things and not enough of others. At the present time we do not produce enough of houses and means for transportation and distribution. If we did produce enough of those things rents would not be so high, the average family could enjoy more rooms, it would be easier to commute to and from the suburbs; and by narrowing the spread between wholesale and retail prices every one might acquire more things. In short, it would not be so hard for the young people to raise their families as it continues to be.

A socialistic economy might abolish such mal-

adjustment if it had one omniscient and omnipotent head. But even so it would not be easy to shift surplus cotton spinners from Massachusetts to be bricklayers in New York; and if it were, the bricklayers' union might object.

Let it be remarked that excessive producing capacity means always an excessive personnel attached to each industry. What to do with it is really the great problem. The operators of plants may contract their scale of production; indeed are bound to do so; but *ipso facto* that crystallizes out the superfluity of workers. Eventually they become dispersed into other work, just as migration from the farms to the towns has been going on, but this is a slow process, and to it organized labor offers a resistance.

## Steel Quality and Tonnage

IT is not especially remarkable that last year's pig iron production, 39,372,729 tons, was third best in the list of years, but it is startling to observe that one of the two greater years was 1916, ten years earlier. We have been familiar with large tonnage increases in pig iron, the Hewitt rule of doubling by decades having prevailed for a long time.

Yet 1926 was a good year in point of tonnage, as it was also in point of fresh service rendered to mankind by iron products. One finds a partial explanation of this difference between tonnage and service by considering products. Going back 20 years, to the time when the finer qualities were but little in evidence in point of tonnage, we find that in 1906 the production of pig iron was 25,307,065 tons. The increase to 1926 was 55.5 per cent. In 1906, however, the production of rolled iron and steel and steel castings was 20,362,173 tons, while last year it was about 36,600,000 tons, the increase being nearly 80 per cent.

One factor in the changed proportion between pig iron and the actual commercial products in the 20 years is the substantial increase in the proportion of old material passing into new products. That applies on the steel side of the account. Using production of foundry and malleable pig iron and



ferrosilicon as an index to iron castings, 1906 production was 5,545,000 tons and 1926 production 7,518,000 tons, representing an increase of only 35.8 per cent. The mere change from iron castings to rolled material is a substantial contribution to service, for in general a ton of rolled steel does much more good than a ton of cast iron. We have also, in the statistics cited, a large decrease of rolled iron, yielding to steel, and for many uses the steel undoubtedly renders the superior service, though the merits of good wrought iron for certain purposes will readily be conceded.

Thus in the mere change from iron to steel we have a progress in 20 years much greater than the 55.5 per cent shown by pig iron production. When comparison is made between the average steel of today and the average of 20 years ago there is much greater progress. The steel of today runs much better in physical properties, whereby less weight is used for a given function, and it is rolled in vastly greater variety, so that the facility of fabrication and adaptation is greatly increased. We have some products substantially new in point of tonnage, including the seamless tube and the strip. Tin plate is not a new thing, but its production nearly trebled in the 20 years. Thus the 55.5 per cent increase in pig iron in 20 years, and the lack of any increase, comparing 1916 and 1926, is no criterion of the real success of the iron and steel industry in rendering service.

### Illusory Averages

THE wealth of statistical information and generalization now available to the business man is not without drawbacks. It may seem to have made it easier for one to reach his conclusions, but painstaking effort is still necessary. Averages in particular are deceptive unless great care is exercised in applying them. The whole is made up of its parts, but the parts are not necessarily the same. When an average swings in this direction or that it must not be lightly assumed that all the parts move in the same way.

Take the daily rate of steel ingot production, for instance. It is followed with great interest, but there should be no inference that any given finished steel product is fluctuating in the same manner. There is speculation as to whether this year's total steel production will fall below that of last year. While it is probable that there will be little difference, it is quite certain that individual commodities are undergoing marked changes. We know now that last year's steel ingot production was 7 per cent above that of 1925, but when the statistics of production in individual lines are presented some three months hence some wide divergences are certain to be shown.

The rate of automobile production has become a puzzling question by this same token. One or two makers are doing much better than last year, several are doing somewhat better, and two prominent cars are in much lighter production than formerly. Quite divergent views have been expressed lately as to the position of the automobile trade as a whole, according to which side is given the more prominence.

The course of commodity prices contains its own illusion. There has been much comment on

the "steady fall" of commodity prices, when the broader view is that prices have been steady relative to their frequent course in the past, while a further observation is that the relative steadiness of the general average is not typical of individual groups of commodities, much less of single commodities. There have been important swings, and only the general average has been comparatively steady. Even within the steel trade itself the past four years have brought noteworthy changes in price relationships which make generalizations as to marked tendencies more difficult than ever.

### Inefficiency in Retailing

ACCORDING to a recent survey by the Department of Agriculture, the retail prices for vegetables and fruits in New York are about twice the wholesale prices for such goods landed in New York. There are about 250 wholesalers, 600 jobbers, 13,500 retail shops, 11,000 hucksters, besides many hotels and restaurants. It may be assumed roughly that there are 30,000 agencies, of one kind or another, effecting the distribution of foodstuffs to a population of 6,000,000, or one agency to every 200 of population. A large proportion of these agencies employ more than one person, many of them employ a large number of persons.

In respect to the distribution of clothing, fuel, and all the other articles of regular consumption the condition is similar. We need not be too critical of the data cited. They may be accepted as broadly sketching a great picture. Probably the most wasteful thing in our whole economy is the manner in which our goods are distributed for final consumption. In this there is the greatest inefficiency, which is summarized in the declaration that too many persons are employed in doing it. Each of those persons may be industrious. Many of them are known to work long hours. Most of them accomplish nothing better than barely earning their own living. Their intentions are good, but their efforts are misdirected, or undirected.

A corrective of this has been applied in the organization of department stores, chain stores and mail order houses, which in general have achieved great success, underselling the individual merchant by virtue of their better organization and avoidance of ineffectual effort. In so far as our national economy is concerned, however, the effect of these improved organizations has not yet been much more than that of a few drops in a bucket of water, our system of retail distribution being in the aggregate so very great. Probably something like 10 per cent of our working population is thus employed, exclusive of those who are engaged in transportation by railroading, trucking, boating, etc.

Special interest is directed to this subject by a controversy that has arisen in Detroit over the operations of Henry Ford, who in the first instance organized company stores for the benefit of his own workpeople and subsequently extended the privilege to the local public. Purchases for these stores being in great quantities, according to well-known Ford principles, and their conduct showing the same efficiency that obtains in Ford manufacturing, it appears that these retail distributions have seriously affected the business of not only the small

merchants, but also that of the local chain stores. Nor has this been accomplished by any charitable injection or any illusory system of accounting, for, as every one knows, Mr. Ford is not given to such ways. On the contrary his retail stores are reported to be earning rather handsome profits.

Fear among old-time retailers has spread beyond Detroit. The secretary of the Missouri Retail Grocery Merchants Association wrote a letter to Mr. Ford in which he remarked, among other things:

Why should you, after having been favored by God in acquiring your wealth, try to drive your fellow men in other lines out of business? You are trying to mislead the people into the belief that the corner retailer is holding them up, overcharging, etc. You know it is not true. You are sowing the spirit of suspicion, hatred and discontent among the public toward the little retailer. You are helping to destroy the community builder.

If Mr. Ford succeeds in arousing the spirit of suspicion among consumers, they may be moved to look at many things in different ways. This may even open the eyes of senators who represent the agrarian States in Congress, and who have complained so bitterly that the farmer realizes only about one-third of the retail prices for his products. It may open minds to the fact that the enormous difference does not go toward the enrichment of what is generically described as Wall Street, but rather that it is appropriated for the support of several millions of our fellow citizens who get their living out of working in a humble, but often inefficient, way owing to the absence of such a directing head as that of Henry Ford.

The small retailer should not be thin-skinned in respect to idle opinions that he skins the public. Probably he is victimized by the public more often than the other way around. Generically he is not a gouger. He need not fear the bogey of Henry Ford, for a general correction of the wastefulness of himself and his employees would require a super-Ford. While it is to be expected that the general trend of economic events will be in the direction that he fears, he may be assured that progress in this direction will be very slow.

AN example of hearty cooperation of employees as a factor in the maintenance of the service of a shop to its customers in time of unusual stress is given in a recent experience of the Atlas Forgings Co., Cicero, Ill. This forge shop was built during the war period when it was advisable to use wooden construction wherever possible because of the delays often encountered in obtain-

ing structural steel. On the night of Nov. 6, 1926, the shop was destroyed by fire. A part of the crew was immediately put to work clearing away debris and overhauling the steam hammers and furnaces. In less than three weeks, and in mid-winter, a portion of the orders on the company's books were being filled by workmen standing in the open with no overhead protection and only hurriedly constructed wind breaks. The work of construction with brick and steel progressed rapidly, so that by March 1 the shop was under cover, all the equipment had been overhauled, and production had been resumed at normal capacity.

### Advance in Water-Power Practice

IN the development of the falls of the Connecticut River at Bellows Falls, Vt., in which the New England Power Co. is adding another to its series of hydroelectric stations on the Connecticut and Deerfield Rivers, we have a striking example of the advance made in recent years in the efficiency of turbo-electric generating units. For years the waters of these falls have been driving 70 turbines, developing a total of 10,000 horsepower. The same canal which led water to these wheels will soon be supplying three turbines whose combined output will be 60,000 horsepower.

But the canal will deliver 4,200,000 gallons per minute, while the 70 wheels received only 1,000,000 gallons. Theoretically, had there been enough of the smaller wheels to consume this increased amount, they would have produced 42,000 horsepower. The greater efficiency of the three 20,000-horsepower wheels is represented by the difference of 18,000 horsepower, which figures out at 45 per cent. Where the old wheels absorbed only a little more than 60 per cent of the power of the falling water, the new wheels will convert over 90 per cent of it into electric current. The New England Power Co.'s new station at Davis Bridge on the Deerfield River, also producing 60,000 horsepower, has an efficiency of 91 per cent.

The improvement in engineering knowledge and practice which accomplished this great saving consists partly in the installation of the wheels, but the greatest gain is in the design of the wheel itself, chiefly in its moving parts and to a lesser degree in its water passages. At Bellows Falls in nine months of the year all the waters of the Connecticut River will pass through the turbine buckets, and then energy will be distributed in central and eastern Massachusetts and in Rhode Island.

Now, however, the board has agreed to take care of labor matters for its members and has unanimously declared for the open shop in structural steel erection.

### Iron League and Structural Steel Board of Trade Unite

Effective April 1, the Iron League of New York and the Structural Steel Board of Trade, New York, have amalgamated and the offices have been consolidated at 100 East Forty-fifth Street. R. B. Thomas, executive secretary of the Iron League, joins the Structural Steel Board of Trade as counsel and will have charge of labor, employee welfare, insurance, legal and legislative services.

The Structural Steel Board of Trade was formed more than a year ago to engage in such cooperative matters for steel fabricators and erectors as did not touch on the relations between employer and employee.

Members of the Engineers' Society of Western Pennsylvania were guests of the Carnegie Steel Co. on an inspection trip through the Homestead works on Tuesday afternoon, March 29. Special cars were provided on regular Pennsylvania Railroad trains during the noon hour and luncheon was served at the plant prior to the trip through the mills, the interesting part of which was the opportunity afforded to see in operation the new Carnegie beam section mill.



## RATE SITUATION UNAFFECTED

### O'Fallon Decision Does Not Portend Change in General Rate Level

WASHINGTON, April 5.—The decision of the Interstate Commerce Commission in the excess income case of the St. Louis & O'Fallon Railway Co. last week will have no effect one way or the other on railroad rates. The commission, in dealing with a recapture case such as this one, has made a valuation of this property for recapture of excess earnings on the basis used by it in 1920 in making the existing rates.

The valuation of the O'Fallon property, as with valuations of all properties made by the commission, was made on the basis of 1914 unit prices and the cost of net additions to the property since that time.

It is expected that this case will be appealed to the Supreme Court of the United States finally and that the action by that court will determine the basis on which value of railroad property must be found by the commission.

The commission held that use of estimates of cost of reproduction at current prices as the sole or controlling criterion in the determination of value for rate-making purposes was improper and unsound. It held that the value of the property of a railroad for rate-making purposes approached more nearly the reasonable and necessary investment in the property than

the cost of reproduction of it at a particular time. This view was opposed by Commissioners Hall, Woodlock, Aitchison and Taylor. Commissioner Hall said the majority had not applied the law governing valuations as construed by the Supreme Court of the United States.

If all of the railroad properties of the United States were valued on the basis of the O'Fallon case, the valuation in the aggregate at this time would be from \$22,000,000,000 to \$23,000,000,000, or approximately \$2,000,000,000 less than the book investment account.

The \$22,000,000,000 valuation is predicated on the valuation of \$18,900,000,000 placed on the railroads in 1920, when the commission increased rates from 25 per cent to 40 per cent, with net additions since that time.

The general level of existing rates was prescribed by the commission in 1922, when it ordered a general reduction of 10 per cent. These rates were expected to yield approximately 5% per cent in net railroad operating income on the valuation of \$18,900,000,000 brought down to 1922 by net additions. In 1926 the railroads earned approximately, as a whole, a net operating income that was probably a trifle in excess of 5% per cent on \$22,000,000,000.

If, therefore, the O'Fallon finding should be sustained and there were no substantial change in general price levels, there would be no substantial change in the general rate level.

### Revised Rates on Scrap Lead and Zinc Suspended

WASHINGTON, April 5.—The Interstate Commerce Commission has suspended until Nov. 1 the operation of schedules that would revise the rates on scrap lead and scrap zinc from Pittsburgh and group points to destinations in eastern Trunk Line and New England territories. The schedules would result in increases ranging from 2.5c. to 6c. per 100 lb. by way of the Pennsylvania Railroad and in reductions by way of the Pittsburgh & Lake Erie Railroad.

The following rates from Pittsburgh, expressed in cents per 100 lb., are illustrative:

To	Pennsylvania	P. & L. E.	Proposed
Boston .....	21	30.5	25
New York .....	19	28.5	23
Cumberland, Md..	16	21.5	18.5

### Rates on Brass Ingots Upheld

WASHINGTON, April 5.—Rates on brass ingots, in carloads from Newark, N. J., to destinations in New England territory are not unreasonable or otherwise unlawful, according to a tentative report by C. J. Peterson, examiner of the Interstate Commerce Commission, passing upon a complaint by the Federated Metals Corporation, New York. He also held that rates on copper scrap and brass scrap, in carloads, between Newark and points in New England have not been unreasonable or otherwise unlawful as applied to past shipments, but held that for the future they will be unreasonable to the extent they exceed the sixth class rates.

### Acquires Patent Rights on King Pressure Toggle

The V. & O. Press Co., Hudson, N. Y., has acquired the patent rights on the King pressure toggle, and plans to furnish it for its own and other makes of presses. The King toggle is a device for use with single-action power presses in connection with drawing operations, and by means of its use many operations which formerly required double-action presses may be performed on single-action presses. The toggle requires no air pressure and the single-action press may be used as a blanking press without removing the device.

### Cut Lake Rate on Finished Iron and Steel

Effective May 5, the Lake rate on finished iron and steel products from Cleveland to the upper Lake ports will be reduced 3½c. per 100 lb., or from 22½c. to 19c. An effort is being made to apply this reduction on the rail-and-water haul from inland points and to make it effective on the same date, but there is some doubt that the tariff can be filed and put into effect at that date. The reduced Lake rate applies only on shipments out of Cleveland, and when the combined rail-and-water rate from inland points to Duluth and Minneapolis and St. Paul becomes effective, it will be limited to shipments routed via Cleveland.

### Upholds Rates on Sheet Copper

WASHINGTON, April 5.—Recommending dismissal of a complaint made by the Kawneer Co., producing and selling sheet metal work at Niles, Mich., Examiner F. A. Christoph, in a report to the Interstate Commerce Commission last week, held that rates on sheet copper in straight or in mixed carloads with other non-ferrous products from Kenosha, Wis., to Niles are not unreasonable or otherwise unlawful.

### Sea-Going Barges Completed by Tennessee Company

BIRMINGHAM, April 5.—The Tennessee Coal, Iron & Railroad Co. has made the first test of two of four sea-going barges to be built at Mobile and to be employed in developing trade with the Southwest, Texas in particular. The two barges, built along new lines, have been brought up the Warrior River and are being loaded with steel preparatory to shipment via Mobile, and New Orleans to Galveston, Houston and other Texas ports. Birmingham steel is now expected to compete strongly with water-transported steel from around Pittsburgh and Sparrows Point both in the Southwest and on the Pacific coast.

Exports of builders' hardware in 1926 totaled \$4,124,851, a decline of \$287,625, or 6.5 per cent, as compared with 1925, according to figures of the Department of Commerce, Washington.

# March Iron Output Makes Large Gain

Heaviest Production Since April, 1926—Daily Rate 7342 Tons or 7 Per Cent Larger Than February—Net Gain of 4 Furnaces

MARCH pig iron production was the largest since April, 1926, and easily exceeded the same month last year. Complete returns from all furnaces show the daily rate last month to have been 112,366 gross tons per day. This is an increase of 7342 tons per day or about 7 per cent over the 105,024 tons per day in February. The March rate in 1926 was 111,032 tons per day and the next largest was 115,004 tons per day in April, last year. March records of 1925 and 1923 exceeded this year, however.

The production of coke pig iron for the 31 days of March was 3,483,362 tons or 112,366 tons per day as compared with 2,940,679 tons or 105,024 tons per day for the 28 days of February. In March, last year, 3,441,986 tons was made, the daily rate having been 111,032 tons. Thus March, this year, was about 1.2 per cent larger.

The net gain in furnaces last month was six, with nine blown in and three shut down. In February the net gain was nine and in January it was five, making the net gain for the first quarter 20 furnaces.

On April 1 there were 223 furnaces active as com-

pared with 217 furnaces on March 1. The estimated daily capacity of the 223 furnaces blowing on the first day of April was 113,435 tons as compared with 106,135 tons per day for the 217 furnaces active on March 1. The large excess in the daily capacities on April 1 over March 1, with a net gain of six furnaces, is explained by the unusually rapid rate of operations in

	Steel Works	Merchants*	Total
March, 1926	85,841	25,191	111,032
April	89,236	25,768	115,004
May	86,682	25,622	112,304
June	82,186	25,658	107,844
July	79,392	24,586	103,978
August	78,216	25,025	103,241
September	81,224	23,319	104,543
October	83,188	24,365	107,553
November	82,820	25,070	107,890
December	74,909	24,803	99,712
January, 1927	75,609	24,514	100,123
February	80,595	24,429	105,024
March	86,304	26,062	112,366

\*Includes pig iron made for the market by steel companies.

	March (31 days)	Feb. (28 days)	Jan. (31 days)	Dec. (31 days)
New York and Mass.	232,561	198,877	212,856	210,243
Lehigh Valley	97,046	83,712	89,381	88,182
Schuylkill Valley	86,357	75,063	79,010	65,283
Lower Susq. and Lebanon Valleys	52,922	42,753	48,313	48,537
Pittsburgh district	725,418	604,415	654,225	645,592
Shenango Valley	127,295	100,142	105,748	96,732
Western Penna.	126,905	102,912	97,818	105,996
Maryland, Virginia and Kentucky	99,366	90,620	89,990	88,488
Wheeling district	136,116	113,632	130,872	128,077
Mahoning Valley	301,941	265,389	287,686	281,275
Central and North- ern Ohio	353,977	303,080	302,339	321,684
Southern Ohio	47,567	42,189	47,160	42,892
Illinois and Indiana	661,496	534,605	553,013	557,064
Mich., Minn., Mo., Wis., Colo. and Utah	156,405	140,730	152,266	151,468
Alabama	271,097	236,786	246,536	252,932
Tennessee	6,893	5,774	6,607	6,615
Total	3,483,362	2,940,679	3,103,820	3,091,060

	1923	1924	1925	1926	1927
Jan.	104,181	97,384	108,720	106,974	100,123
Feb.	106,935	106,026	114,791	104,408	105,024
Mar.	113,673	111,809	114,975	111,032	112,366
Apr.	118,324	107,781	108,632	115,004	.....
May	124,764	84,358	94,542	112,304	.....
June	122,548	67,541	89,115	107,844	.....
½ year	115,147	95,794	105,029	109,660	.....
July	118,656	57,577	85,936	103,978	.....
Aug.	111,274	60,875	87,241	103,241	.....
Sept.	104,184	68,442	90,873	104,543	.....
Oct.	101,586	79,907	97,528	107,553	.....
Nov.	96,476	83,656	100,767	107,890	.....
Dec.	94,225	95,539	104,853	99,712	.....
Year	109,713	85,075	99,735	107,043	.....

Furnaces	Total Stacks	April 1— In Capacity Blast per Day	March 1— In Capacity Blast per Day
New York:			
Buffalo	21	12	5,600
Other N. Y. and Mass.	6	5	1,970
New Jersey	3	0	0
Pennsylvania:			
Lehigh Valley	11	6	2,880
Spiegelstein	2	2	245
Schuylkill Valley	12	6	2,785
Susquehanna Valley	4	3	1,355
Ferromanganese	1	1	75
Lebanon Valley	1	1	190
Ferromanganese	2	1	85
Pittsburgh District	52	40	23,200
Ferro. and Spiegel	4	1	175
Shenango Valley	13	8	4,105
Western Pennsylvania	18	7	4,075
Ferromanganese	2	2	305
Maryland	5	6	2,505
Ferromanganese	1	0	0
Wheeling District	13	9	4,485
Ohio:			
Mahoning Valley	26	16	9,740
Central and Northern	23	19	11,415
Southern	13	5	1,535
Illinois and Indiana	44	35	22,000
Mich., Wis. and Minn.	12	7	3,095
Colo., Mo. and Utah	7	4	1,950
The South:			
Virginia	15	1	245
Ferromanganese	1	1	85
Kentucky	5	1	370
Alabama	34	22	8,660
Ferromanganese	1	1	85
Tennessee	12	1	220
Total	364	223	113,435

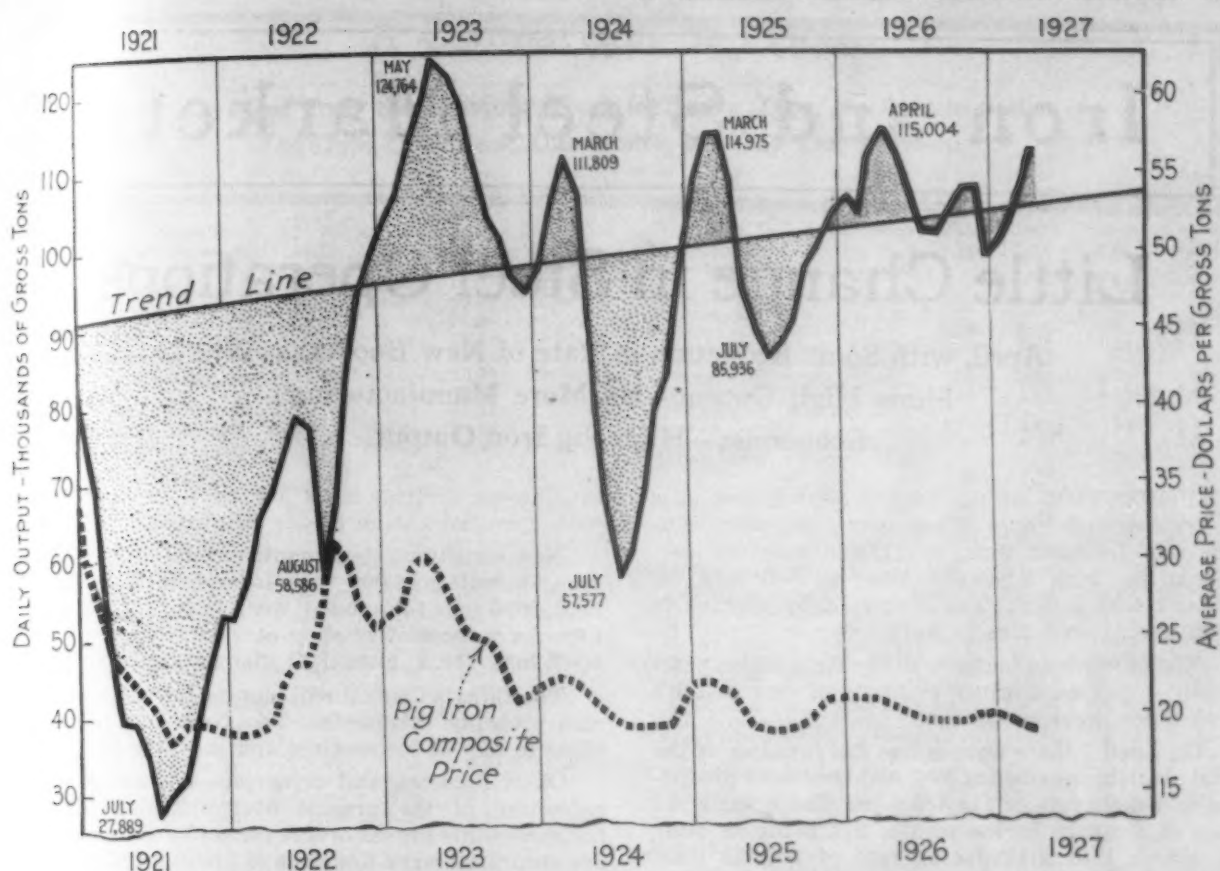
	Total Iron, Spiegel and Ferro	1926 Fe-Mn Spiegel	1927 Fe-Mn Spiegel
Jan.	2,599,876	2,342,881	29,129
Feb.	2,272,150	2,256,651	22,309
Mar.	2,661,092	2,675,417	24,064
Apr.	2,677,094	.....	24,134
May	2,687,138	.....	23,159
June	2,465,583	.....	25,378
½ year	15,362,933	148,173	42,083
July	2,461,161	.....	26,877
Aug.	2,424,687	.....	23,557
Sept.	2,436,733	.....	25,218
Oct.	2,578,830	.....	28,473
Nov.	2,484,620	.....	31,903
Dec.	2,322,180	.....	31,627
Year	30,071,144	315,828	74,096

\*Includes output of merchant furnaces.

	1925	1926	1927
Jan.	3,370,336	3,316,201	3,103,820
Feb.	3,214,143	2,923,415	2,940,679
Mar.	3,564,247	3,441,986	3,483,362
Apr.	3,258,958	3,450,122	.....
May	2,930,807	3,481,428	.....
June	2,673,457	3,235,309	.....
½ year	19,011,948	19,848,461	.....
July	2,664,024	3,223,338	.....
Aug.	2,704,476	3,200,479	.....
Sept.	2,726,198	3,136,293	.....
Oct.	3,023,370	3,334,132	.....
Nov.	3,023,006	3,236,707	.....
Dec.	3,250,448	3,091,060	.....
Year*	36,403,470	39,070,470	.....

\*These totals do not include charcoal pig iron. The 1926 production of this iron was 163,830 tons.





Daily Pig Iron Output in March 7 Per Cent Larger Than in February; Composite Price Lower

Inclined line represents the gradually increasing theoretical needs of the country, and shows that production is considerably above the so-called normal. Dotted line represents THE IRON AGE composite price

March. The Gary furnaces established a record for all time for March, the previous best achievement having been in March last year. Of the nine furnaces blown in six were independent steel company stacks, two were Steel Corporation units and one was a merchant furnace. One Steel Corporation and two independent steel company furnaces were blown out.

#### Total Number of Furnaces Reduced

The total number of possibly active furnaces has been reduced from 365 to 364, the Covington furnace of the Low Moor Iron Co. in Virginia having been scrapped.

#### Manganese Alloys Produced

March production of ferromanganese was 27,834 tons as compared with 31,844 tons in January, also a 31-day month. It was larger than the monthly average of 26,319 tons in 1926 and brings the output for the first quarter to 28,079 tons per month, an increase over last year's rate. Speiseleisen production last month was 7650 tons or the largest this year.

#### Furnaces Blown In and Out

Furnaces which were blown in during March were No. 2 Donner furnace in the Buffalo district; No. 2 Clairton furnace and No. 1 Lucy furnace of the Carnegie Steel Co. and No. 2 Monessen furnace of the Pittsburgh Steel Co. in the Pittsburgh district; two furnaces at the Cambria plant of the Bethlehem Steel Corporation in western Pennsylvania; No. 1 furnace of the Weirton Steel Co. in the Wheeling district, and No. 9 Gary furnace and one Federal furnace in the Chicago district.

Furnaces blown out or banked during March include No. 3 Isabella furnace in the Pittsburgh district; one furnace at the Cambria plant of the Bethlehem Steel Corporation in western Pennsylvania and one Mayville furnace in Wisconsin.

### Adopts Tentative Standard for Grading Foundry Sands

Recognizing that there has been a growing sentiment among several producers and foundrymen that a uniform method of grading foundry sands would be of advantage to all concerned, the executive committee of the joint committee on molding sand research of the American Foundrymen's Association, late in 1924, created a sub-committee on grading, composed of representatives from the foundrymen and sand producer groups. This sub-committee considered the various systems in use, compiled and examined a large mass of data on sands under production and, after two years of work and numerous committee meetings, presented a report at the 1926 Detroit meeting of the association in which it recommended practical methods for grading or classifying foundry sands as regards their fineness and clay contents. These methods were approved by the executive committee of the joint committee, and in December, 1926, were also approved as tentative standards by the board of directors of the A. F. A.

Under the title, "A Tentative Standard Method for Grading Foundry Sands," the association has issued a four-page leaflet which presents the details of the methods adopted and which can be procured by addressing the secretary of the association at 140 South Dearborn Street, Chicago, sending 10c. to cover mailing and postage. It is the hope of the directors of the A. F. A. that these methods of grading or classifying sands will be used by foundrymen, sand producers and others throughout the country and it is recommended that foundrymen grade the sand they are using according to the system outlined and that the A. F. A. grade numbers be used wherever practical; also that sand producers and sales organizations grade their products according to the same system and offer them under their A. F. A. grade numbers.

# Iron and Steel Markets

## Little Change in Steel Operations

April, with Some Reduction in Rate of New Bookings, Will  
Show High Output—No More Manufacturing  
Economies—High Pig Iron Output

**P**RODUCTION of pig iron in March was at a rate exceeded only in one month last year. Output was 3,483,362 tons, or 112,366 tons per day, comparing with 2,940,679 tons in February, or 105,024 tons a day. The highest daily average in 1926 was 115,004 tons in April.

The percentage increase in the daily make, practically 7 per cent, gives evidence of last month's high steel ingot production.

On April 1 there were active 223 furnaces of the total available number of 364, and they were producing at a daily rate of 113,435 tons. There was a net gain of 6 stacks in the month, 217 being in blast on March 1 at a producing rate of 106,135 tons. Two Steel Corporation furnaces went in and one went out, six independent steel company stacks took the place of two which were retired, and one merchant furnace was added to the active list. Since April 1 another merchant stack has been lighted.

April in steel gives promise of continued heavy operations, chiefly on the momentum of March business. New buying and specifications have let down moderately in the past week, but only a few companies have as yet revised steel making schedules and these represent less than a 5 per cent reduction.

Bars, plates and shapes are not noticeably firmer, irregularities still obtain in sheets and in cold finished bars, and while higher prices obtain on bolts, nuts and rivets, they are accepted on contracts on which specifications will come later. What the steel makers are facing is the virtual end of realizing further economies of manufacture, and leaders among them express the hope of a wider recognition that selling prices are now practically the sole measure of profits.

Threatened importation of European steel by water through the Welland Canal to the Central West is recognized as a likely unsettling price factor, if it should assume measurable proportions. Early efforts in this direction failed partly because of the freight charges, partly because of the difficulty of meeting American requirements and partly because of damage in handling.

The coal strike is still without effect as a market factor, save that reduced haulage does not leave expectations high for much railroad car business. The shutting down of union mines has produced a slightly stronger tone in the coal market, but non-union coal is to be had in good volume.

Automobile makers have ordered a large amount of steel for this month, but new business will be governed by current automobile sales. Some falling off in common sheets is balanced in part by demand for auto-body material, and strip steel mills are operating at a high rate. Bookings of sheets

by Chicago district mills are equal to shipments, with operations at an 85 per cent rate.

New structural steel inquiries total about 54,000 tons, including 16,000 tons for a bridge at Cleveland, 9000 tons for subway work in New York, 7500 tons for a locomotive shop at Eddystone, Pa., and 5000 tons for a municipal viaduct in New York.

The Illinois Central will inquire for 4500 freight cars probably this week. The New York Central plans to buy 66 locomotives and the Erie 50.

Oil well casing and drive pipe is waiting on a correction of the present overproduction of oil, but meanwhile urgent orders for tanks and gas lines are absorbing large tonnages of plates. Chicago reports three companies taking over 13,000 tons and inquiries for 20,000 tons. Two 20-in. gas line contracts, 250 miles in all, will require 44,000 tons of steel. Yet a Pittsburgh district producer of seamless oil well material had to shut down last week.

Early spring weather has brought a demand for wire products heavier than a year ago, particularly from manufacturing consumers, but it is not taxing mill capacity.

In pig iron, buying by steel plants and pipe foundries is a feature along the Eastern seaboard. A Steel Corporation plant in eastern Pennsylvania, usually supplied by other subsidiaries, has bought upward of 18,000 tons of basic iron. An independent Eastern steel company has purchased 15,000 tons of the same grade, while a locomotive company steel works has closed for 5000 tons of copper-bearing low-phosphorus iron. A round tonnage of low-phosphorus iron will also be bought by a New England plant of the Steel Corporation. An Eastern pipe foundry purchased 5000 tons from an eastern Pennsylvania furnace and a pipe plant in Virginia placed 10,000 tons with a Virginia producer.

The Ford Motor Co.'s purchase of 385,000 tons of Minnesota ore is expected to be closed this week. Opinion is general that for 1927 last year's prices will be established. Bethlehem's purchase of upward of 150,000 tons of Swedish low phosphorus ore is for its Sparrows Point plant where its output of Bessemer steel products is increasing.

An unusual order of the week was for 35,000 steel fence posts for Ohio State for road markers.

Foreign fluorspar has declined to \$16.50 per net ton, duty paid, Atlantic seaboard, on a German offering for early shipment.

THE IRON AGE pig iron composite price advanced to \$19.21 from \$19.13 last week and a low of \$18.96 a month ago. The finished steel composite price remains at 2.367c. a lb. for the seventh week.



# A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics  
At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	Apr. 5, 1927	Mar. 29, 1927	Mar. 8, 1927	Apr. 6, 1926
No. 2, fdy., Philadelphia...	\$21.76	\$21.76	\$21.76	\$22.76
No. 2, Valley Furnace...	18.50	18.50	18.50	19.00
No. 2, Southern, Cin'ti...	21.69	21.69	21.69	25.69
No. 2, Birmingham...	18.00	18.00	18.00	22.00
No. 2 foundry, Chicago*	20.00	20.00	20.00	22.00
Basic, del'd eastern Pa.	20.75	20.75	21.00	21.75
Basic, Valley furnace...	19.00	19.00	18.00	19.00
Valley Bessemer, del. P'gh	21.26	21.26	21.26	21.76
Malleable, Chicago*	20.00	20.00	20.00	22.00
Malleable, Valley	18.50	18.50	18.50	19.00
Gray forge, Pittsburgh...	19.76	19.76	19.76	20.76
L. S. charcoal, Chicago...	27.04	27.04	27.04	29.04
Perromanganese, furnace...	100.00	100.00	100.00	88.00

Rails, Billets, etc., Per Gross Ton:	Apr. 5, 1927	Mar. 29, 1927	Mar. 8, 1927	Apr. 6, 1926
O.-h. rails, heavy, at mill...	\$43.00	\$43.00	\$43.00	\$43.00
Light rails at mill...	36.00	36.00	36.00	34.00
Bess. billets, Pittsburgh...	34.00	34.00	34.00	35.00
O.-h. billets, Pittsburgh...	34.00	34.00	34.00	35.00
O.-h. sheet bars, P'gh...	34.00	34.00	34.00	36.00
Forging billets, P'gh...	40.00	40.00	40.00	40.00
O.-h. billets, Phila...	39.30	39.30	38.30	40.30
Wire rods, Pittsburgh...	43.00	43.00	43.00	45.00
Skelp, grvd. steel, P'gh, lb.	1.90	1.90	1.90	1.90

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.12	2.12	2.12	2.22
Iron bars, Chicago...	2.00	2.00	2.00	2.00
Steel bars, Pittsburgh...	1.90	1.90	1.90	2.00
Steel bars, Chicago...	2.00	2.00	2.00	2.10
Steel bars, New York...	2.24	2.24	2.24	2.34
Tank plates, Pittsburgh...	1.85	1.85	1.85	1.90
Tank plates, Chicago...	2.00	2.00	2.00	2.10
Tank plates, New York...	2.19	2.19	2.19	2.24
Beams, Pittsburgh...	1.90	1.90	1.90	1.90
Beams, Chicago...	2.00	2.00	2.00	2.10
Beams, New York...	2.19	2.19	2.19	2.24
Steel hoops, Pittsburgh...	2.30	2.30	2.30	2.50

\*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Apr. 5, 1927	Mar. 29, 1927	Mar. 8, 1927	Apr. 6, 1926
Sheets, black, No. 24, P'gh	2.75	2.75	2.75	3.10
Sheets, black, No. 24, Chi-	2.95	2.95	2.95	3.30
cago dist. mill...	3.65	3.65	3.65	4.05
Sheets, galv., No. 24, P'gh	3.85	3.85	3.85	4.25
Sheets, galv., No. 24, Chi-	2.20	2.20	2.20	2.50
cago dist. mill...	2.35	2.35	2.30	2.60
Wire nails, Pittsburgh...	2.55	2.55	2.55	2.65
Wire nails, Chicago dist.	2.60	2.60	2.60	2.70
mill	2.40	2.40	2.40	2.50
Plain wire, Pittsburgh...	2.45	2.45	2.45	2.55
Barbed wire, galv., P'gh...	3.25	3.25	3.25	3.35
Barbed wire, galv., Chi-	3.30	3.30	3.30	3.40
cago dist. mill...	\$5.50	\$5.50	\$5.50	\$5.50
Tin plate, 100 lb. box, P'gh				

Old Material, Per Gross Ton:	Apr. 5, 1927	Mar. 29, 1927	Mar. 8, 1927	Apr. 6, 1926
Carwheels, Chicago...	\$15.25	\$15.00	\$15.00	\$16.50
Carwheels, Philadelphia...	16.00	16.00	16.00	17.50
Heavy melting steel, P'gh...	16.75	16.75	16.50	17.00
Heavy melting steel, Phila...	14.50	14.50	14.50	16.50
Heavy melting steel, Ch'go	13.25	13.25	12.75	13.75
No. 1 cast, Pittsburgh...	16.00	16.00	15.75	16.50
No. 1 cast, Philadelphia...	17.00	17.00	17.00	17.50
No. 1 cast, Ch'go (net ton)	16.50	16.50	16.50	16.25
No. 1 RR. wrot. Phila...	16.50	17.00	17.00	17.50
No. 1 RR. wrot. Ch'go (net)	12.50	12.50	12.00	12.75

Coke, Connellsville, Per Net Ton at Oven:	Apr. 5, 1927	Mar. 29, 1927	Mar. 8, 1927	Apr. 6, 1926
Furnace coke, prompt...	\$3.25	\$3.25	\$3.50	\$3.00
Foundry coke, prompt...	4.25	4.25	4.50	4.25

Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	13.25	13.37 1/2	13.50	14.12 1/2
Electrolytic copper, refinery	12.87 1/2	12.87 1/2	13.12 1/2	13.75
Zinc, St. Louis...	6.55	6.52 1/2	6.77 1/2	7.20
Zinc, New York...	6.90	6.87 1/2	7.12 1/2	7.55
Lead, St. Louis...	7.00	7.10	7.35	8.00
Lead, New York...	7.25	7.35	7.65	8.25
Tin (Strait), New York...	69.75	68.00	70.00	63.75
Antimony (Asiatic), N. Y.	13.50	14.00	13.00	18.00

## Pittsburgh

### Moderate Let-Down in Steel Buying After Month of Heavy Production—44,000 Tons of Line Pipe Placed

PITTSBURGH, April 5.—The steel industry, as a result of its heavy output and shipments in March, appears to have supplied the immediate requirements of the consuming industries, because the past week has been marked by a distinct although moderate let-down in new buying and specifications. Plant activities, as measured by ingot production, have not lessened, but it is a rather general condition that March shipments exceeded incoming business and in few if any of the finished lines are the mills starting the new month with as much business as they had at the beginning of March.

The automotive industry will very likely take a good deal of steel this month in shipments against orders placed last month, but new bookings from that source will be governed by the amount of business done by automobile dealers, who just now are well stocked. An early spring is favorable to building construction work and will probably mean steady releases of structural steel. But against those possibilities is the fact that standard-section rail shipments have been in large measure completed, and in view of the likelihood of lighter loadings on account of the soft coal strike, opinion is not very hopeful here that the demand for railroad cars will amount to much in the near future. Heavy deliveries of tin plate suggest a lighter movement over the next few months.

A heavy movement of oil well pipe and casing is

dammed up, awaiting a correction of the overproduction of oil, but efforts in that direction do not yet appear to have made much progress. There is plenty of gas pipe line business, the past week having brought out one for 44,000 tons of 20-in. pipe for the Southwest, but general pipe business is not what it should be at this time of the year, and mill operations are tapering.

It looks very much as if March, with its record output of steel and pig iron, was repeating what that month did last year and the year before. April gives promise of being a good month from an operating standpoint, but chiefly on the momentum of March.

The soft coal strike seems to have fallen on a cushion, so little stir has been created in this district by its occurrence. There are some who believe that the strike and its possibilities are not regarded seriously enough, but with the heavy supplies of coal that are available and the fact that non-union coal still is to be had in good volume, the more common disposition of steel consumers is to observe the philosophy, "sufficient unto the day is the evil thereof."

Efforts to raise prices are making almost no progress. The advances set up in strips have not yet had any serious test, while there are too many producers for the sheet market to make headway back to what manufacturers call a profitable level. Bars, plates and shapes are not noticeably firmer than they have been, and while higher prices for bolts, nuts and rivets seemingly are being accepted readily by buyers, they are being accepted on contracts, against which specifications will come later. There is idle tin plate capacity.

It is hard to imagine a quieter market than exists in pig iron. The shutting down of union coal mines has produced a slightly stronger tone in the coal market, but no unusual activity. Scrap prices in the main are stronger, but consumer activity is lacking.

**Pig Iron.**—The market is firm at recent prices, but the principal reason for that condition is that producers are not pressing sales, because there is only a limited demand. A few carloads of foundry iron are being moved daily and a few small lots of Bessemer are being sold, but there is no demand for basic grade. Consumers generally are well supplied or covered against their immediate requirements, and it takes a good deal of canvassing to find any outlet for even small tonnages. The coke market has not been affected by the suspension of union coal mines, and, altogether, pig iron melters seem satisfied to let the future take care of itself. W. P. Snyder & Co. make the average price of Bessemer iron from Valley furnaces in March \$19.39 and of basic, \$18.57, as compared with \$19 and \$18 in February.

Prices per gross ton f.o.b. Valley furnace:

Basic .....	\$19.00
Bessemer .....	19.50
Gray forge .....	\$18.00 to 18.50
No. 2 foundry .....	18.50 to 19.00
No. 3 foundry .....	18.00 to 18.50
Malleable .....	18.50 to 19.00
Low phosphorus, copper free....	28.00

Freight rate to the Pittsburgh or Cleveland district, \$1.76.

**Ferroalloys.**—Standing out in interest is the fact that the Steel Corporation appears to have a greater production of ferromanganese than is necessary to supply its own requirements and those of a few outside companies which it has been serving over the past few years, and is seeking either early delivery or last half business. This will make a total of four producers that will seek a share in the business for the last half of the year, all of them American companies, one of which markets foreign material. The cost of ore is too high for British makers to ship to American markets without violating the provisions of the anti-dumping law. A Virginia furnace was recently blown in on the production of spiegeleisen, and with this additional supply, an easier spot market in that product seems likely. A little German spiegeleisen is being offered at \$38, Atlantic seaboard, but spot offerings of domestic material lately have been only such tonnages as contract consumers have failed to specify. New business in all of the commonly used ferroalloys is light, but a good movement is reported on contracts. Recent prices are maintained.

**Fluorspar.**—The market is slightly weaker on gravel fluorspar. All domestic producers are not holding to \$18 per net ton, f.o.b. mines, for spar analyzing 85 per cent calcium fluoride and not more than 5 per cent silica, while a recent consignment of German spar was shipped ahead of schedule and, getting to this country at a time when demand was slack, was offered at about cost, or \$16.50 per net ton, Atlantic seaboard, duty paid, for early shipment. Importers are quoting \$17, or higher, for shipments after May 1, but for spot shipment it is available at \$16.50. Large domestic producers are holding at \$18, mines, but some other producers are going to \$17 for prompt shipment business.

**Semi-Finished Steel.**—Shipments of billets, slabs and sheet bars on agreements existing between producers and consumers are reported to be large, but

open market transactions are so few as to make a price appraisal difficult. The common quotation of Pittsburgh mills is \$34, Pittsburgh or Youngstown, for sheet bars and large billets and slabs, but there are quotations by outside mills on the last two named forms of \$33.50, Youngstown, and that is all that Pittsburgh mills could obtain if they shipped, as some do, to customers in the territory taking the Youngstown rate of freight. The quotation of \$43, base Pittsburgh or Cleveland, for wire rods is strictly a small-lot price and is being shaded materially on sizable tonnages. Skelp is slow, and the quotation of 1.90c. is merely nominal. Forging quality steel is holding well at \$40, base Pittsburgh.

**Wire Products.**—Spring weather over most of the country is two to four weeks earlier than last year, and the movement of wire products into consumption is aided by that fact. As there has been little advance buying this year, the increase in consumption finds quick reflection in demands upon the mills, which are making the heaviest shipments in fully a year. But large as is the current movement, it is not taxing capacity, and a single daily turn of the mills is proving sufficient to supply requirements. Prices are steady in most districts, but there is a good deal of competition in the South. The high rate of automobile production is stimulating sales of spring wire.

**Rails and Track Supplies.**—Heavy shipments since the middle of last December of standard-section rails have supplied most roads for their spring and early summer track-laying programs, and the movement now is lighter than it has been. Light rails are not moving with much freedom but are holding well as to prices. Track bolts, ¾ in. and smaller, are now quoted on a piece basis at 70 per cent off list, in keeping with the recent revision of bolt prices, while 13/16 in. and ¾ in., the sizes commonly used by the railroads, remain on a pound basis, with the base size, ¾ x 4 in., quoted at \$3.90 to \$4 per 100 lb. Not much activity is noted in track accessories. Prices are given on page 1027.

**Tubular Goods.**—The overproduction of oil continues a restrictive factor in the demand for oil well casing and drill and drive pipe, having built up stocks in preparation for the usual spring demand, manufacturers are now finding it necessary to cut production. One Pittsburgh district producer of seamless casing and oil well pipe shut down last week for an indefinite period. The mills are well provided with line pipe business, and it is fairly general report that the call for standard pipe has improved somewhat in the past week or ten days. Business as a whole is subnormal, but prices are well maintained. There is a fairly active market in boiler tubes and mechanical tubing. Discounts are given on page 1027.

The Empire Gas & Fuel Co. has placed 150 miles of 20-in. line pipe with the Youngstown Sheet & Tube Co. and 100 miles of the same size with Spang, Chalfant & Co., for a gas line to run from Amarillo, Tex., into Oklahoma and Kansas. The pipe runs almost 66 lb. per ft., making a total of almost 44,000 tons.

**Sheets.**—Business is holding at about the recent rate, showing neither gain nor loss. Prices likewise are

## THE IRON AGE Composite Prices

### Finished Steel

April 5, 1927, 2.367c. a Lb.

One week ago.....	2.367c.
One month ago.....	2.367c.
One year ago.....	2.439c.
10-year pre-war average.....	1.689c.

Based on steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 87 per cent of the United States output of finished steel.

	High		Low	
1927	2.453c.	Jan. 4:	2.367c.	Feb. 21
1926	2.453c.	Jan. 5:	2.403c.	May 18
1925	2.560c.	Jan. 6:	2.396c.	Aug. 18
1924	2.789c.	Jan. 15:	2.460c.	Oct. 14
1923	2.824c.	April 24:	2.446c.	Jan. 2

### Pig Iron

April 5, 1927, \$19.21 a Gross Ton

One week ago.....	\$19.13
One month ago.....	18.96
One year ago.....	21.04
10-year pre-war average.....	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1927	\$19.71.	Jan. 4:	\$18.96.	Feb. 15
1926	21.54.	Jan. 5:	19.46.	July 13
1925	22.50.	Jan. 13:	18.96.	July 7
1924	22.88.	Feb. 26:	19.21.	Nov. 3
1923	30.86.	March 20:	20.77.	Nov. 20



# Mill Prices of Finished Iron and Steel Products

## Iron and Steel Bars Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills.....	1.90c.
F.o.b. Chicago.....	2.00c. to 2.10c.
F.o.b. Philadelphia.....	2.22c.
Del'd New York.....	2.24c.
Del'd Cleveland.....	2.09c.
F.o.b. Cleveland.....	1.90c.
F.o.b. Birmingham.....	2.05c. to 2.15c.
C.i.f. Pacific ports.....	2.35c.
F.o.b. San Francisco mills.....	2.35c. to 2.40c.

## Billet Steel Reinforcing

F.o.b. Pittsburgh mills.....	1.90c.
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## Rail Steel

F.o.b. mill.....	1.75c. to 1.80c.
F.o.b. Chicago.....	1.90c. to 2.00c.

## Iron

Common iron, f.o.b. Chicago.....	2.00c.
Refined iron, f.o.b. P'gh mills.....	2.75c.
Common iron, del'd Philadelphia.....	2.12c. to 2.22c.
Common iron, del'd New York.....	2.14c. to 2.24c.

## Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mill.....	1.80c. to 1.90c.
F.o.b. Chicago.....	2.00c. to 2.10c.
F.o.b. Birmingham.....	1.95c. to 2.05c.
Del'd Cleveland.....	2.09c.
Del'd Philadelphia.....	2.12c. to 2.22c.
Del'd New York.....	2.14c. to 2.24c.
C.i.f. Pacific ports.....	2.25c. to 2.30c.

## Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills.....	1.90c.
F.o.b. Chicago.....	2.00c. to 2.10c.
F.o.b. Birmingham.....	2.05c. to 2.15c.
Del'd Cleveland.....	2.09c.
Del'd Philadelphia.....	2.07c. to 2.22c.
Del'd New York.....	2.14c. to 2.24c.
C.i.f. Pacific ports.....	2.35c.

## Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, narrower than 6 in., P'gh.....	2.30c.
All gages, 6 in. to 12 in., P'gh.....	2.10c.
All gages, narrower than 6 in., Chicago.....	2.40c. to 2.60c.
All gages, 6 in. and wider, Chicago.....	2.30c. to 2.50c.

\*Mills follow plate or sheet prices according to gage on wider than 12 in.

## Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills.....	2.40c.
Bars, f.o.b. Chicago.....	2.40c.
Bars, Cleveland.....	2.35c. to 2.45c.
Shafting, ground, f.o.b. mill.....	2.55c. to 3.00c.
Strips, f.o.b. Pittsburgh mills.....	3.00c.
Strips, f.o.b. Cleveland mills.....	3.00c.
Strips, delivered Chicago.....	3.30c. to 3.55c.

\*According to size.

## Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails.....	\$2.55
Galv'd nails.....	4.55
Galvanized staples.....	3.25
Polished staples.....	3.00
Cement coated nails.....	2.55

	Base Per 100 Lb.
Bright plain wire, No. 9 gage.....	\$2.40
Annealed fence wire.....	2.55
Spring wire.....	3.40
Galv'd wire, No. 9.....	3.00
Barbed wire, galv'd.....	3.25
Barbed wire, painted.....	3.00

Chicago district mill and delivered Chicago prices are \$1 per ton above the foregoing. Birmingham mill prices \$3 a ton higher; Worcester, Mass., mill \$3 a ton higher on production of that plant; Duluth, Minn., mill \$2 a ton higher; Anderson, Ind., \$1 higher.

## Woven Wire Fence

	Base to Retailers Per Net Ton
F.o.b. Pittsburgh.....	\$65.00
F.o.b. Cleveland.....	65.00
F.o.b. Anderson, Ind.....	66.00
F.o.b. Chicago district mills.....	67.00
F.o.b. Duluth.....	68.00
F.o.b. Birmingham.....	68.00

## Sheets

### Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh.....	2.20c. to 2.25c.
Nos. 9 and 10, f.o.b. Ohio mill.....	2.20c. to 2.25c.
Nos. 9 and 10, f.o.b. Chicago dist. mill.....	2.35c. to 2.45c.
Nos. 9 and 10, del'd Philadelphia.....	2.52c. to 2.57c.
Nos. 9 and 10, f.o.b. Birmingham.....	2.35c. to 2.45c.

### Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh.....	2.75c. to 2.90c.
No. 24, f.o.b. Ohio mill.....	2.80c. to 2.90c.
No. 24, f.o.b. Ch'go dist. mill.....	2.95c. to 3.05c.
No. 24, del'd Philadelphia.....	3.07c. to 3.17c.
No. 24, f.o.b. Birmingham.....	3.00c. to 3.10c.

### Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade.....	3.90c. to 4.05c.
No. 24, f.o.b. Pittsburgh, B grade.....	3.75c. to 3.95c.

### Galvanized

No. 24, f.o.b. Pittsburgh.....	3.65c. to 3.75c.
No. 24, f.o.b. Ohio mill.....	3.70c. to 3.75c.
No. 24, f.o.b. Chicago dist. mill.....	3.85c. to 3.95c.
No. 24, del'd Philadelphia.....	4.02c. to 4.07c.
No. 24, f.o.b. Birmingham.....	3.90c. to 4.00c.

### Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh.....	3.00c. to 3.10c.
No. 28, f.o.b. Chicago dist. mill.....	3.10c. to 3.20c.

### Automobile Body Sheets

No. 20, f.o.b. Pittsburgh.....	4.15c.
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### Long Ternes

No. 24, 8-lb. coating, f.o.b. mill.....	4.10c. to 4.30c.
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### Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills.....	\$5.50
Standard cokes, f.o.b. Gary and Elwood, Ind.....	5.60

### Terne Plate

(F.o.b. Morgantown or Pittsburgh)  
(Per package, 20 x 28 in.)

8-lb. coating, 100 lb. base.....	\$11.40
20-lb. coating I.C.....	\$16.20
8-lb. coating I.C. 11.78	25-lb. coating I.C. 17.90
15-lb. coating I.C. 14.85	30-lb. coating I.C. 19.45
	40-lb. coating I.C. 21.65

### Alloy Steel Bars

(F.o.b. Pittsburgh or Chicago)

S. A. E.  
Series  
Numbers

Base Per 100 Lb.

2100* (1/2% Nickel, 0.10% to 0.20% Carbon).....	\$3.00 to \$3.15
2300 (3 1/4% Nickel).....	4.30 to 4.40
2500 (5% Nickel).....	5.50
3100 (Nickel Chromium).....	3.30 to 3.40
3200 (Nickel Chromium).....	4.75 to 5.00
3300 (Nickel Chromium).....	7.00 to 7.25
3400 (Nickel Chromium).....	6.25 to 6.50
5100 (Chromium Steel).....	3.30 to 3.40
5200* (Chromium Steel).....	7.00 to 7.50
6100 (Chrom. Vanadium bars).....	4.20 to 4.30
6100 (Chrom. Vanad. spring steel).....	3.80
9250 (Silicon Manganese spring steel).....	3.20 to 3.25

Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.).....	4.10 to 4.20
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.).....	4.20 to 4.30
Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.).....	4.25 to 4.35
Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.).....	3.40 to 3.50
Chromium Molybdenum spring steel (1—1.25 Chrom., 0.30—0.50 Molybdenum).....	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2 1/2-in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

\*Not S. A. E. specification, but numbered by manufacturers to conform to S. A. E. system.

## Rails

	Per Gross Ton
Standard, f.o.b. mill.....	\$43.00
Light (from billets), f.o.b. mill.....	36.00
Light (from rail steel), f.o.b. mill.....	34.00
Light (from billets), f.o.b. Ch'go mill.....	\$36.90 to 38.90

## Track Equipment

(F.o.b. Mill)

	Base Per 100 Lb.
Spikes, 1 1/2 in. and larger.....	\$2.80 to \$3.00
Spikes, 1 1/2 in. and smaller.....	2.90 to 3.25
Spikes, boat and barge.....	3.25
Tie plates, steel.....	2.85
Angle bars.....	2.75
Track bolts, 1 1/2 in. and 3/4 in.....	3.90 to 4.00
Track bolts, 3/4 in. and smaller, per 100 count.....	70 per cent off list

## Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld			Iron		
Inches	Steel	Galv.	Inches	Black	Galv.
1/4 to 3/8	45	19 1/2	1/4 to 3/8	+11	+39
1/2 to 3/4	51	25 1/2	1/2 to 3/4	22	2
1 to 1 1/4	56	42 1/2	1 to 1 1/4	28	11
1 1/2 to 2	60	48 1/2	1 1/2 to 2	30	13
2 to 3	62	50 1/2			
2 to 6	55	43 1/2	2 to 6	23	7
6 to 8	59	47 1/2	6 to 8	26	11
8 and 10	56	43 1/2	8 to 10	28	13
10 and 12	54	41 1/2	10 to 12	26	11
	53	40 1/2			

### Lap Weld

2 to 6	55	43 1/2	2 to 6	23	7
6 to 8	59	47 1/2	6 to 8	26	11
8 and 10	56	43 1/2	8 to 10	28	13
10 and 12	54	41 1/2	10 to 12	26	11
	53	40 1/2			

### Butt Weld, extra strong, plain ends

1/4 to 3/8	41	24 1/2	1/4 to 3/8	+19	+54
1/2 to 3/4	47	30 1/2	1/2 to 3/4	21	17
1 to 1 1/4	53	42 1/2	1 to 1 1/4	28	12
1 1/2 to 2	58	47 1/2	1 1/2 to 2	30	14
2 to 3	60	49 1/2			
	61	50 1/2			

### Lap Weld, extra strong, plain ends

2 to 4	53	42 1/2	2 to 4	23	9
4 to 6	57	46 1/2	4 to 6	29	15
6 to 8	56	45 1/2	6 to 8	28	14
8 to 10	52	39 1/2	8 to 10	21	15
10 and 12	45	32 1/2	10 to 12	16	2
	44	31 1/2			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1 1/2 points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2 1/2%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

## Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2 to 2 1/2 in.....	27	1 1/2 in.....	+18
2 1/2 to 3 in.....	37	1 1/2 to 2 in.....	+ 8
3 in.....	40	2 to 2 1/2 in.....	2
3 1/2 to 4 in.....	42 1/2	2 1/2 to 3 in.....	7
4 to 4 1/2 in.....	46	3 1/2 to 4 in.....	9

Beyond the above discounts, 5 to 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

### Standard Commercial Seamless Boiler Tubes

Cold Drawn		Hot Rolled	
1 in.....	60	3 in.....	45
1 1/4 to 1 1/2 in.....	52	3 1/2 to 4 in.....	47
1 1/2 in.....	56	4 in.....	50
2 to 2 1/2 in.....	31	4 1/2, 5 and 6 in.....	45
2 1/2 to 3 in.....	39		

2 and 2 1/2 in.....	37	3 1/2 and 4 in.....	53
2 1/2 and 3 in.....	45	4 in.....	56
3 in.....	51	4 1/2, 5 and 6 in.....	51

Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

## Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base.....	55
Carbon, 0.30% to 0.40%, base.....	50
Plus differentials for lengths over 15 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.	

neither stronger nor weaker than they have been. There is still a little too much competition for efforts by some mills to advance prices to succeed. Some of the larger producers want 2.80c., base, for black sheets, but too firm insistence on that price not infrequently means the loss of an order. In galvanized sheets the producers who want 3.65c., base, have to overcome quotations \$1 a ton lower by small makers. Blue annealed sheets are the steadiest of the common finishes, although directly subject to strip sheet competition. Automobile body sheets are doing well as to shipments and prices, but the loss of the usual amount of Ford and Dodge business is not entirely made good by the increased requirements of builders of other makes of cars.

**Tin Plate.**—New business, as is usual at this time of year, amounts to little, but there is a good movement against contracts and leading producers have good operations, although not so good as they had during the first two and one-half months of the year. Container manufacturers are pretty well stocked, and there is still some uncertainty as to the pack of some of the vegetable crops, because of the surplus from the 1926 pack. There is some idle tin plate capacity because of the increase in the number of Eastern and Chicago district mills.

**Cold-Finished Steel Bars and Shafting.**—March shipments of makers in this district quite generally run ahead of those of March last year. This constitutes a favorable showing in view of the dependence of the industry upon automobile parts makers and the fact that Dodge Brothers and the Ford Motor Co. took much less steel than usual. New business has dropped off somewhat in the past fortnight, but March specifications will mean good shipments this month and a recovery in new orderings will be governed by the rate of the movement of cars out of dealers' hands. Dealers now are well stocked, and builders are disposed to make new production conform to retail sales. The ordinary small-lot price of cold-finished steel bars is 2.40c., base Pittsburgh.

**Bolts, Nuts and Rivets.**—The experience of local manufacturers is that with very little explanation, consumers and distributors are falling in line readily with the new mode of quotation of bolts and nuts and the new price setup in large rivets.

**Steel and Iron Bars.**—Specifications are still fairly active in steel bars and there is a moderately good current demand, but the volume is somewhat smaller than it was over much of last month. The ordinary tonnage price in this district remains at 1.90c., base Pittsburgh. Iron bars are slow and easy.

**Structural Steel.**—There seems to have been a fairly good balance between orders and shipments, and mills in this area still have fair-sized order books. Structural steel fabricators are doing more estimating than entering of new jobs and still find competition on fabricated steel very sharp. Plain material is still bringing 1.90c., Pittsburgh, on the every-day tonnages.

**Plates.**—Mills here are still fairly well supplied

with business. A large gas line pipe order, calling for approximately 44,000 tons, will help out plate mill operations here and in Youngstown. Tankage business is lighter, but the prospect is still good in river barges. The ordinary tonnage price of plates is 1.90c., with large lots going at lower figures.

**Hot-Rolled Flats.**—March was a month of heavy shipping and also of good ordering in strips, but shipments appear to have exceeded orders and few makers have as much live tonnage now as they had a month ago. There was too much coverage at lower prices for present prices to be seriously tested, but on such new business as is developing, no deviations from the ruling quotations are noted. Makers of hoops and bands are very firm at 2.30c., base.

**Cold-Rolled Strips.**—Order books appear to have suffered as a result of heavy shipments last month, and makers are starting with slightly smaller obligations than they had at the beginning of March. Makers are holding firmly to 3c., base, Pittsburgh or Cleveland, on new business, but there has been very little of that because of the heavy coverage given prior to the advance in prices.

**Coke and Coal.**—The market has a slightly firmer undertone and is a little higher on good steam coal and on gas coal, the supply of which has been reduced by the suspension of the union coal mines. But there is no increase worthy of note in the demand, because consumers are not much disturbed, since non-union coal is obtainable and most of them have ample reserve stocks. Coke is not actively wanted. Foundries seem to have built up their stocks. The blast furnaces that operate on Connellsville beehive oven coke are covered by contracts, and with no interruption in production in that region, shipments are full. Prices are given on page 1029.

**Old Material.**—A shortage of machine shop turnings and insistence on the part of consumers for delivery against purchases has stiffened the price of that grade of scrap. While no consumer has gone above \$12.50, dealers who are short are going up to \$13 to cover short sales. The market is likely to stiffen on the blast furnace grades as a result of that situation, for while the consumptive demand for them is moderate, they are likely to be taken for delivery against machine shop turning orders. Another feature is the sale of a round tonnage of heavy melting steel to a Pittsburgh district steel company at \$16.75, which appears to be a compromise, since it is exactly halfway between what recently has been asked and offered. Compressed sheets have been sold up to \$16.25, and higher prices are noted on some of the low phosphorus grades and for heavy breakable cast scrap.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

#### Basic Open-Hearth Furnace Grades:

Heavy melting steel.....	\$16.50 to \$17.00
Scrap rails .....	16.00 to 16.50
Compressed sheet steel.....	15.75 to 16.25
Bundled sheets, sides and ends...	14.50 to 15.00
Cast iron carwheels .....	16.00 to 16.50
Sheet bar crops, ordinary.....	18.00 to 18.50
Heavy breakable cast.....	15.75 to 16.25
No. 2 railroad wrought.....	16.50 to 17.00
Heavy steel axle turnings.....	15.00 to 16.00
Machine shop turnings.....	13.00

#### Acid Open-Hearth Furnace Grades:

Railroad knuckles and couplers...	18.50 to 19.00
Railroad coil and leaf springs...	18.50 to 19.00
Rolled steel wheels .....	18.50 to 19.00
Low phosphorus billet and bloom ends .....	21.00 to 21.50
Low phosphorus mill plate.....	20.50 to 21.00
Low phosphorus, light grade.....	18.00 to 18.50
Low phosphorus sheet bar crops...	20.00 to 20.50
Heavy steel axle turnings.....	15.00 to 16.00

#### Electric Furnace Grades:

Low phosphorus punchings.....	19.25 to 19.75
Heavy steel axle turnings.....	15.00 to 16.00

#### Blast Furnace Grades:

Short shoveling steel turnings...	12.50 to 13.00
Short mixed borings and turnings	12.50 to 13.00
Cast iron borings.....	12.50 to 13.00
No. 2 busheling.....	12.50 to 13.00

#### Rolling Mill Grades:

Steel car axles .....	21.50 to 22.00
No. 1 railroad wrought.....	13.00 to 13.50

#### Cupola Grades:

No. 1 cast .....	16.00 to 16.50
Rails, 3 ft. and under.....	19.50 to 20.00

#### Malleable Grades:

Railroad .....	16.50 to 17.00
Industrial .....	16.00 to 16.50
Agricultural .....	15.50 to 16.00

#### Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates .....	3.00c.
Structural shapes .....	3.00c.
Soft steel bars and small shapes.....	2.90c.
Reinforcing steel bars .....	2.75c.
Cold-finished shafting and screw stock—	
Rounds and hexagons.....	3.60c.
Squares and flats .....	4.10c.
Bands .....	3.60c. to 3.65c.
Hoops .....	4.00c. to 4.50c.
Black sheets (No. 24 gage), 25 or more bundles .....	3.75c.
Galvanized sheets (No. 24 gage), 25 or more bundles .....	4.50c.
Blue annealed sheets (No. 10 gage), 25 or more sheets .....	3.30c.
Spikes, large .....	3.30c. to 3.40c.
Small .....	3.80c. to 5.25c.
Boat .....	3.80c.
Track bolts, ¾ in. and smaller, per 100 count .....	62½ per cent off list
Machine bolts, per 100 count.....	62½ per cent off list
Carriage bolts, per 100 count.....	62½ per cent off list
Nuts, all styles, per 100 count.....	62½ per cent off list
Large rivets, base per 100 lb.....	\$3.50
Wire, black soft annealed, base per 100 lb.....	2.90
Wire, galvanized soft, base per 100 lb.....	2.90
Common wire nails, per keg.....	2.90
Cement coated nails, per keg.....	2.95



# Semi-Finished Steel, Raw Materials, Bolts and Rivets

## Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms	
	Per Gross Ton
Rerolling, 4-in. and over.....	\$33.50 to \$34.00
Rerolling, under 4-in. to and in- cluding 1½-in. ....	34.50 to 35.00
Forging, ordinary .....	40.00
Forging, guaranteed .....	45.00

Sheet Bars	
	Per Gross Ton
Open-hearth or Bessemer.....	\$34.00

Slabs	
	Per Gross Ton
8 in. x 2 in. and larger.....	\$33.50 to \$34.00
Smaller than 8 in. x 2 in.....	34.50 to 35.00

Skelp	
	Per Lb.
Grooved .....	1.90c.
Sheared .....	1.90c.
Universal .....	1.90c.

Wire Rods	
	Per Gross Ton
*Common soft, base.....	\$43.00
Screw stock .....	\$5.00 per ton over base
Carbon 0.20% to 0.40% .....	3.00 per ton over base
Carbon 0.41% to 0.55% .....	5.00 per ton over base
Carbon 0.56% to 0.75% .....	7.50 per ton over base
Carbon over 0.75% .....	10.00 per ton over base
Acid .....	15.00 per ton over base

\*Chicago mill base is \$44. Cleveland mill base, \$43.

## Prices of Raw Materials

### Ores

Lake Superior Ores, Delivered Lower Lake Ports	
	Per Gross Ton
Old range Bessemer, 51.50% iron.....	\$4.55
Old range non-Bessemer, 51.50% iron.....	4.40
Mesabi Bessemer, 51.50% iron.....	4.40
Mesabi non-Bessemer, 51.50% iron.....	4.25
High phosphorus, 51.50% iron.....	4.15
Foreign Ore, c.i.f. Philadelphia or Baltimore	

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria, .....	10.50c. to 11.00c.
Iron ore, Swedish, average 66% iron.....	10.00c.
Manganese ore, washed, 52% manganese, from the Caucasus.....	40c. to 41c.
Manganese ore, Brazilian, African or Indian, basis 50% .....	40c. to 42c.
Tungsten ore, high grade, per unit, in 60% concentrates .....	\$11.00 to \$12.00
Chrome ore, Indian basic, 48% Cr <sub>2</sub> O <sub>3</sub> , crude, c.i.f. Atlantic seaboard.....	\$22.50
Molybdenum ore, 85% concentrates of MoS <sub>3</sub> , delivered .....	50c. to 55c.

### Coke

Furnace, f.o.b. Connellsville	
	Per Net Ton
prompt .....	\$3.25 to \$3.40
Foundry, f.o.b. Connellsville prompt .....	\$4.25 to 4.50
Foundry, by-product, Ch'go ovens .....	9.75
Foundry, by-product, New England, del'd .....	12.50
Foundry, by-product, Newark or Jersey City, delivered.....	9.59 to 10.77
Foundry, Birmingham .....	5.50 to 6.00
Foundry, by-product, St. Louis.....	10.50

### Coal

Mine run steam coal, f.o.b. W. Pa. mines	
	Per Net Ton
.....	\$1.60 to \$2.00
Mine run coking coal, f.o.b. W. Pa. mines .....	1.80 to 2.00
Mine run gas coal, f.o.b. Pa. mines .....	2.00 to 2.25
Steam slack, f.o.b. W. Pa. mines.....	1.45 to 1.50
Gas slack, f.o.b. W. Pa. mines.....	1.60 to 1.70

### Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd.....	\$100.00
Foreign, 80%, Atlantic or Gulf port, duty paid .....	100.00

### Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21% .....	\$37.00
Domestic, 16 to 19% .....	36.00

### Electric Ferrosilicon

	Per Gross Ton Delivered
50% .....	\$85.00
75% .....	145.00
	Per Gross Ton Furnace
10% .....	\$35.00
11% .....	37.00
	Per Gross Ton Furnace
12% .....	\$39.00
14 to 16% .....	\$45 to 46.00

### Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace	
	Per Gross Ton
10% .....	\$34.00
11% .....	36.00
	Per Gross Ton
12% .....	\$38.00

### Silvery Iron

F.o.b. Jackson County, Ohio, Furnace	
	Per Gross Ton
6% .....	\$26.50
7% .....	27.50
8% .....	28.50
9% .....	30.00
	Per Gross Ton
10% .....	\$32.00
11% .....	34.00
12% .....	36.00

### Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd .....	\$1.05 to \$1.10
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads .....	11.50c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace .....	\$3.15 to \$3.65
Ferrocobaltititanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads.....	\$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton.....	\$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per net ton.....	\$122.50

### Fluxes and Refractories

#### Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines.....	\$18.00
No. 2 lump, Illinois and Kentucky mines.....	\$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid, .....	\$16.50 to \$17.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines.....	\$32.50

#### Fire Clay

	Per 1000 f.o.b. Works
	First Quality Second Quality
Pennsylvania .....	\$43.00 to \$46.00 \$35.00 to \$38.00
Maryland .....	43.00 to 46.00 35.00 to 38.00
New Jersey .....	50.00 to 65.00
Ohio .....	43.00 to 46.00 35.00 to 38.00
Kentucky .....	43.00 to 46.00 35.00 to 38.00
Missouri .....	43.00 to 46.00 35.00 to 38.00
Ground fire clay, per ton .....	7.00

#### Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania .....	\$43.00
Chicago .....	52.00
Birmingham .....	50.00
Silica clay, per ton.....	\$8.50 to 10.00

#### Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa. ....	\$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa. ....	40.00

#### Chrome Brick

	Per Net Ton
Standard size .....	\$45.00

## Mill Prices of Bolts, Nuts, Rivets and Set Screws

### Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine bolts .....	70
Carriage bolts .....	70
Lag bolts .....	70
Plow bolts, Nos. 1, 2, 3 and 7 heads.....	70
Hot-pressed nuts, blank or tapped, square.....	70
Hot-pressed nuts, blank or tapped, hexagon.....	70
C.p.c. and t. square or hex. nuts, blank or tapped .....	70
Washers* .....	6.75c. to 6.50c. per lb. off list

\*F.o.b. Chicago and Pittsburgh. †Bolts with rolled threads up to and including ¾ in. x 6 in. take 10 per cent lower list prices.

### Bolts and Nuts

Per Cent Off List

Semi-finished hexagon nuts .....	70
Semi-finished hexagon castellated nuts, S.A.E. ....	70
Stove bolts in packages.....	80, 10 and 5
Stove bolts in bulk.....	80, 10, 5 and 2½
Tire bolts .....	60 and 5

### Large Rivets

(½-In. and Larger)

Base per 100 Lb.

F.o.b. Pittsburgh or Cleveland.....	\$2.75
F.o.b. Chicago.....	2.85

### Small Rivets

(½-In. and Smaller)

Per Cent Off List

F.o.b. Pittsburgh .....	70, 10 and 5
F.o.b. Cleveland .....	70, 10 and 5 to 70 and 10
F.o.b. Chicago .....	70, 10 and 5 to 70 and 10

### Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

Per Cent Off List

Milled cap screws .....	80, 10 and 10
Milled standard set screws, case hardened, .....	80 and 10
Milled headless set screws, cut thread.....	80
Upset hex. head cap screws, U.S.S. thread.....	85 and 5
Upset hex. cap screws, S.A.E. thread.....	85 and 5
Upset set screws .....	80, 10 and 10
Milled studs .....	70 and 5

# Chicago

## Steel Output at Full Capacity—Increasing Volume of Forward Buying

CHICAGO, April 5.—Ingot production in the Chicago district is at full capacity, and there are no indications of a subsidence either in demand or plant operations. A year ago in March, specifications warranted production at or close to a record pace, but order books at the opening of April had become lean and incoming business was not in sufficient volume to sustain the heavy rate of output. At the present time, however, the incoming business curve is pointed upward and there appears to be an excellent opportunity for April production to continue on a large scale.

In years past heavy shipments of car materials have accounted in good measure for heavy production schedules, this having been true to some extent of the third month of 1926. This year, however, the proportion of car material tonnage is not so heavy, giving further evidence, in view of heavy output, of the widespread demand at this time.

Building permits in Chicago have established a record both for the past month and for the first quarter. The local market is overbalanced in favor of building projects calling for heavy tonnages. This situation works out to the disadvantage of small and average size shops but places the large fabricator in a favorable position.

Specifications for plates, shapes and bars are in excess of shipments. New buying is swinging upward as users in increasing number place orders for the next 90 days. In the meantime, with mill operations at full capacity in nearly all lines, backlogs are becoming more substantial and deliveries are extending.

**Pig Iron.**—The market is active both in spot and in second quarter buying. The uncertainty of future developments resulting from the coal strike is prompting some users to seek third quarter contracts, and in several instances pig iron for that period has been placed. Specifications are heavier, and some melters, particularly those who furnish castings to the automobile trade, have ordered shipments in excess of their scheduled requirements. Shipments have outgrown production, and April 15 has been set as the date on which another merchant stack will be added to the active list. A western Michigan melter has placed 1000 tons of foundry iron. A foundry in Milwaukee is inquiring for 500 tons for third quarter delivery, and a user in Joliet, Ill., will take 800 tons for shipment during the current quarter. Two hundred tons of 8 per cent silvery has been sold in southern Wisconsin. The charcoal iron market is steady.

### Prices per gross ton at Chicago:

Northern No. 2 foundry, sil. 1.75 to 2.25	\$20.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75	20.50
Malleable, not over 2.25 sil.	20.00
High phosphorus	20.00
Lake Superior charcoal, averaging sil. 1.50	27.04
Southern No. 2 fdy. (all rail)	24.01
Southern No. 2 (barge and rail)	22.18
Low phos., sil. 1 to 2 per cent, copper free	\$31.50 to 32.50
Silvery, sil. 8 per cent	33.29
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Prices are delivered at consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

**Ferroalloys.**—An Eastern producer of spiegeleisen has entered this market with tonnages available for second quarter shipment at \$37, base Hazard, Pa., or \$44.76, delivered, for the 18 to 22 per cent grade. Specifications for ferrosilicon are in good volume. Ferromanganese is quiet, and the price is steady at \$107.56, delivered.

Prices delivered Chicago: 80 per cent ferromanganese, \$107.56; 50 per cent ferrosilicon, \$85; spiegeleisen, 18 to 22 per cent, \$44.76.

**Structural Material.**—Lettings of fabricated steel include close to 12,000 tons of work for which formal contracts are expected to be signed this week. It is reported that some contracts are being taken on a

pound price basis. Small fabricating shops in Chicago, Omaha and Kansas City are operating at a low rate. This does not appear to be due to lack of business in the building field but is rather a result of the character of awards, the bulk of going tonnages being of large size and therefore not suited to fabrication in shops of limited capacity. In some cases promoters are finding it difficult to finance projects, but on the whole the trade feels that the building outlook is better than a year ago. The two leading mills in this district have bid 2c., Chicago, on shapes for the Pennsylvania Railroad. This is in line with the general market here, where 2.10c. is obtainable only on small and mixed lots. Specifications for plain material are in virtually unchanged volume from week to week and on the average are heavier than a year ago.

Mill prices on plain material per lb.: 2c. to 2.10c., Chicago.

**Bolts, Nuts and Rivets.**—Demand is a trifle heavier, particularly from the jobbing trade. Specifications for the week are above the average for March, notwithstanding the fact that large quantities were ordered out last week at the old price schedule.

**Plates.**—Two oil producers in the Southwest have placed tank orders calling for a total of 7600 tons of plates. These purchases closely follow one involving 6100 tons recently made by the Illinois Oil Co., Bartlesville, Okla. The demand for oil storage capacity continues to grow in number of projects and to spread over a wider area in the Western oil producing territory. All told, outstanding inquiry calls for not less than 20,000 tons, of which 6000 tons is for the Gulf Refining Co., Port Arthur, Tex. Several projects are being shaped in Kansas, a producing district that until recently has not required large additions to storage capacity. The tenseness of the oil tankage situation is indicated by the fact that orders to mills in practically all instances are accompanied by specifications for delivery at the earliest possible date. Railroad equipment orders are light, and the only fresh inquiry of note is one from the Pacific Fruit Express for 600 underframes. Carbuilders are maintaining a steady rate of operations and are releasing about the same volume of specifications to the mills from week to week. Reports persist that the Illinois Central will ask for prices this week on from 4000 to 5000 cars and that the inquiry issued last week by the New York Central is the forerunner of others to be put out by that railroad. Steel producers in this territory, in analyzing railroad car purchases, find that in the first quarter of 1926 28,700 freight cars were ordered, of which 18,800 were taken by Western builders. During the first quarter of this year 28,200 cars were purchased, of which 19,800 were placed with shops in the Middle West. While 2c., Chicago, is the general price for plates, producers are making a firm stand for and are obtaining 2.10c. on small tonnages.

**Cast Iron Pipe.**—The market is quiet in and close to Chicago. Large inquiries are almost wholly lacking, and sales are of carlot proportions. Open weather is favorable to pipe laying, and buyers are specifying heavily against past contracts. James B. Clow & Sons are low bidders at \$35, base Birmingham, on 825 tons of 24-in. Class B pipe for Highland Park, Mich. The freight from Birmingham to point of delivery is \$7.92. The Lynchburg Foundry Co. has taken 100 tons of 6-in. Class C pipe for Springfield, Ill., and Mansfield, Ohio, has divided 190 tons between the McWane Cast Iron Pipe Co. and the Hughes Supply Co. Detroit has awarded 125 tons of 12-in. Class C pipe to the Alabama Pipe Co.

Prices per net ton, delivered Chicago: Water pipe, 6-in. and over, \$44.20 to \$45.20; 4-in., \$48.20 to \$49.20; Class A and gas pipe, \$4 extra.

**Wire Products.**—Specifications from the manufacturing trade are large, particularly from makers of bolts, screws and hardware specialties. Expectations of a fairly active spring demand for wire products are being realized. Orders from the jobbing trade are liberal, and though production in several lines, such as woven wire fence, has been speeded up, mill stocks show further reduction. Shipments in March of this year exceeded those of the corresponding month of 1926. Mill prices are steady except on nails. That



commodity is being shaded 5c. per keg in nearby territory and to some extent in Chicago.

**Cold-Rolled Strip.**—Prices are showing a fair degree of strength, and order books are well filled. Production is at close to 85 per cent of capacity, and deliveries are reasonably prompt.

**Hot-Rolled Strip.**—Demand is large, and production is heavy. Prices lack strength, this being indicated more clearly in surrounding territory than in Chicago.

**Rails and Track Supplies.**—Miscellaneous orders for standard-section rails total 2200 tons. Several Western railroads have placed 2000 tons of track accessories, and inquiry before the trade calls for not less than 8000 tons. Steel tie plates are steady at \$2.35, base, per 100 lb.

*Prices f.o.b. mill, per gross ton:* Standard-section open-hearth and Bessemer rails, \$43; light rails, rolled from billets, \$36 to \$38. *Per Lb.:* Standard railroad spikes, 2.90c.; track bolts with square nuts, 3.90c.; steel tie plates, 2.35c.; angle bars, 2.75c.

**Sheets.**—New buying of sheets is approximately equal to shipments, which are being made at the rate of 85 per cent of capacity. Prices are steady but show no tendency to advance, and deliveries range from two to four weeks. Sheet production in March by the Inland Steel Co. was the largest on record.

*Prices per lb., delivered from mill in Chicago:* No. 24 black, 3c. to 3.10c.; No. 24 galvanized, 3.90c. to 4c.; No. 10 blue annealed, 2.40c. to 2.50c. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

**Bars.**—The soft steel bar capacity of the two leading producers is fully engaged. Specifications are unusually heavy, partly as a result of the closing of the quarter and partly because consumption is expanding. Backlogs are growing slowly but steadily, and prompt delivery is obtainable only on a few sizes. Forward contracting has gained ground, and there is more evidence that users are now willing to make commitments for the next three months. The demand for iron bars is more active, but rolling schedules are not to the liking of producers. Prices are steady at 2c., Chicago. Second quarter contracts for alloy steel bars are about equal in volume to those of a year ago. Specifications are liberal, and prices are firm. Production in this district closely approaches 85 per cent of mill capacity. Orders for rail steel bars are heavy. Both Chicago Heights mills are operating on double turn, and for the first time in four or five months shipments are in excess of production, this being accounted for by the unusually heavy demand for fence posts, the largest in the history of local production. The State of Ohio has placed an order for 35,000 posts, the equivalent of 350 tons, which are to be used for road markers. In Chicago the ruling price for hard steel bars is 2c., but in outlying territory competition is keen and 1.90c., Chicago, is the ruling quotation.

*Mill prices per lb.:* Soft steel bars, 2c. to 2.10c., Chicago; common bar iron, 2c., Chicago; rail steel bars, 1.90c. to 2c., Chicago.

**Reinforcing Bars.**—The market continues to grow more active. The demand for new billet bars is in

larger proportion than at any time in the past three or four months. An electric railroad with a terminal in Chicago has ordered 400 tons for a bridge, and an apartment building at Evanston, Ill., calls for 175 tons. The pending list is large, and dealers are looking forward to a steady flow of awards. Fresh inquiry is in good volume, the outstanding new projects being an office building at Rockford, Ill. Paving contracts are numerous, and a substantial amount of mesh reinforcement is moving. Chicago's school building program for the coming year is getting under way, and several sizable educational buildings are being figured on in near-by towns. Prices of both hard steel and new billet reinforcing bars are firm. Recent awards and new inquiries are shown on page 1043.

**Old Material.**—Two steel mills in this district have bought a total of 10,000 tons of heavy melting steel at a range in price of \$13.65 to \$13.75 per gross ton, delivered. Recent sales of this grade added strength to the market until late last week when it became apparent to buyers that, for the most part, the supply of scrap was adequate for all immediate requirements. The car shortage of the last few weeks resulting from heavy movements of coal has been relieved somewhat, and scrap is coming in more freely. A feature of the present market is an increasing tendency on the part of consumers to buy direct from producers. Several buyers have taken 1000-ton lots of cast iron wheels at 25c. above the quotation of a week ago. Railroad lists include 50,000 tons offered by the Pennsylvania and 17,000 tons advertised by the Chicago & North Western.

*Prices delivered consumers' yards, Chicago:*

Per Gross Ton	
Basic Open-Hearth Grades	
Heavy melting steel.....	\$13.25 to \$13.75
Shoveling steel .....	13.25 to 13.75
Frogs, switches and guards, cut apart, and miscellaneous rails.	14.75 to 15.25
Hydraulic compressed sheets....	11.50 to 12.00
Drop forge flashings .....	9.50 to 10.00
Acid Open-Hearth Grades	
Forged, cast and rolled steel car-wheels .....	16.50 to 17.00
Railroad tires, charging box size	16.75 to 17.25
Railroad leaf springs, cut apart..	16.75 to 17.25
Steel couplers and knuckles....	16.00 to 16.50
Coil springs .....	17.00 to 17.50
Low phosphorus punchings.....	15.50 to 16.00
Electric Furnace Grade	
Axle turnings .....	13.00 to 13.50
Blast Furnace Grades	
Axle turnings .....	11.00 to 11.50
Cast iron borings.....	10.50 to 11.00
Short shoveling turnings.....	10.50 to 11.00
Machine shop turnings.....	7.50 to 8.00
Rolling Mill Grades	
Iron rails .....	13.50 to 14.00
Rerolling rails .....	16.00 to 16.50
Cupola Grades	
Steel rails, less than 3 ft.....	17.00 to 17.50
Angle bars, steel.....	14.75 to 15.25
Cast iron carwheels.....	15.25 to 15.75
Malleable Grades	
Railroad .....	16.00 to 16.50
Agricultural .....	14.75 to 15.25
Miscellaneous	
*Relaying rails, 56 to 60 lb.....	25.50 to 26.50
*Relaying rails, 65 lb. and heavier	26.00 to 31.00

Per Net Ton	
Rolling Mill Grades	
Iron angle and splice bars.....	14.00 to 14.50
Iron arch bars and transoms....	13.75 to 19.25
Iron car axles .....	21.50 to 22.00
Steel car axles .....	17.50 to 18.00
No. 1 railroad wrought.....	12.50 to 13.00
No. 2 railroad wrought.....	11.75 to 12.25
No. 1 busheling .....	10.25 to 10.75
No. 2 busheling .....	7.00 to 7.50
Locomotive tires, smooth .....	16.00 to 16.50
Pipes and flues .....	8.00 to 8.50
Cupola Grades	
No. 1 machinery cast.....	16.50 to 17.00
No. 1 railroad cast .....	15.75 to 16.25
No. 1 agricultural cast .....	14.75 to 15.25
Stove plate .....	13.50 to 14.00
Grate bars .....	13.00 to 13.50
Brake shoes .....	12.00 to 12.50
*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.	

#### Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes.....	3.10c.
Soft steel bars .....	3.00c.
Reinforcing bars, billet steel.....	2.30c. to 2.75c.
Cold-finished steel bars and shafting—	
Rounds and hexagons .....	3.60c.
Flats and squares .....	4.10c.
Bands .....	3.65c.
Hoops .....	4.15c.
Black sheets (No. 24).....	3.05c. to 3.15c.
Galvanized sheets (No. 24).....	3.90c. to 4.00c.
Blue annealed sheets (No. 10)....	2.40c. to 2.45c.
Spikes, standard railroad.....	3.55c.
Track bolts .....	4.55c.
Rivets, structural .....	3.60c.
Rivets, boiler .....	3.60c.
Per Cent Off List	
Machine bolts .....	60
Carriage bolts .....	60
Coach or lag screws.....	60
Hot-pressed nuts, hexagons, tapped or blank.	60
Hot-pressed nuts, hexagons, tapped or blank.	60
No. 8 black annealed wire, per 100 lb.....	\$3.20
Common wire nails, base, per keg.....	2.95
Cement coated nails, base per keg.....	2.95

The Mystic Iron Works, Everett, Mass., announces that F. W. Marshall & Co., Pennsylvania Building, Philadelphia, will be its representative in that territory.

# New York

## Large Sale of Pipe Iron—Bookings Gain in Pipe, Sheets and Shapes

NEW YORK, April 5.—Sales of pig iron in this district during the past week totaled about 13,000 tons, of which 5000 tons was pipe iron bought by an Eastern pipe foundry from an eastern Pennsylvania producer. The Richardson & Boynton Co., New York, which was in the market for 900 tons of No. 2 plain and 750 tons of No. 2X for second quarter delivery at Dover, N. J., has closed at quotations that have been outstanding for several weeks. On fresh inquiries New York State furnaces are asking higher prices, in most cases quoting \$17.75 to \$18, base Buffalo, for foundry iron. Quotations at as low as \$17.50, base, have not entirely disappeared, however. Eastern Pennsylvania foundry iron is still obtainable at \$20.50, base furnace, although a more general effort is being made to establish \$21 as a minimum price. The final liquidation of the stocks of a Virginia furnace that is being dismantled has resulted in an advance on Virginia foundry iron to \$21.50, base furnace. The stronger tendency of the market on domestic iron has caused foreign producers to make more active offerings to American importers. Belgian iron has been quoted at \$19.75, c.i.f. port of entry, or \$20.87½, duty paid. Some Indian foundry iron is also being offered but at higher prices than those prevailing on domestic brands. Makers of low phosphorus are figuring on a round tonnage now on inquiry from a Worcester, Mass., steel plant. The Crane Co., Bridgeport, Conn., is also in the market for low phosphorus, asking for 500 to 1000 tons for delivery within 60 days. Purchase of this iron, however, is dependent on the prospective buyer's booking certain business still under negotiation. On the whole, there is a dearth of fresh inquiry. Most melters are well covered through this quarter, and they are in no hurry to make further purchases for more remote delivery.

Prices per gross ton, delivered New York District:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	
(all rail)	\$22.41
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	\$21.89 to 23.02
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	22.39 to 23.52
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	22.89 to 24.02
No. 2 Virginia fdy., sil. 1.75 to 2.25	27.04

Freight rates: \$4.91 from Buffalo, \$1.39 to \$2.52 from eastern Pennsylvania, \$5.54 from Virginia.

**Ferroalloys.**—New business in ferromanganese continues to be confined to carload and small lots at unchanged prices. Most consumers are covered by contracts made late last year, but they are specifying heavily on these. Inquiries and sales of spiegeleisen are also limited to carload and small lots. Importers of this alloy are doing some business for both British and German producers and are quoting \$37 to \$38, seaboard. It is reported that the Oriskany furnace in Virginia, which is now making ferromanganese, will produce spiegeleisen this month. Specifications on other ferroalloys are said to be quite heavy.

**Finished Steel.**—The opening of second quarter, even with such uncertainties as may be caused by the bituminous coal strike, has brought no change in the steel situation. There is a moderately good flow of orders to local sales offices. Some lines, notably pipe, sheets and structural shapes, show slight gains but the volume as a whole has not changed in the first few business days of April. Bars are conspicuously dull. Some second quarter contracts have been made, but as a rule consumers are satisfied that present conditions offer little incentive for the making of contracts and the number that has been entered by the mills is probably smaller than usual. Structural steel tonnage showed a gain in March; one large producer reports that its tonnage for the month was the largest since the middle of last year. Prices of fabricated steel continue at extremely low levels, and in many cases presumably do not leave much, if any, margin of profit for the fabricators, with the result that the

latter are keeping the mills under pressure for concessions on plain material in an effort to recoup their losses. Quotations for ordinary lots of plates are usually 1.90c., Pittsburgh, but the tendency to grant concessions on large and desirable tonnages appears to be a little more pronounced. The advances in sheet prices a few weeks ago, which were to be effective on second quarter business, have not taken a firm hold, and sales for shipment this month are being made at 2.20c. and 2.25c. for blue annealed, 2.80c. for black and 3.65c. to 3.75c. for galvanized, Pittsburgh base. This situation exists, too, in spite of the fact that some of the sheet mills have heavier rolling schedules than at any time this year.

Mill prices per lb., delivered New York: Soft steel bars, 2.24c.; plates, 2.14c. to 2.24c.; structural shapes, 2.14c. to 2.24c.; bar iron, 2.14c. to 2.24c.

**Reinforcing Bars.**—A fair tonnage is involved in small jobs let during the last week, but the rate of new inquiry continues far ahead of lettings. Two warehouses and a street widening project that have come out in the last few days in Manhattan will require 1800

## Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes.....	3.34c.
Soft steel bars and small shapes.....	3.24c.
Iron bars.....	3.24c.
Iron bars, Swedish charcoal.....	7.00c. to 7.25c.
Cold-finished steel shafting and screw stock—	
Rounds and hexagons.....	4.00c.
Flats and squares.....	4.50c.
Cold-rolled strip, soft and quarter hard..	5.75c.
Hoops.....	4.49c.
Bands.....	3.99c.
Blue annealed sheets (No. 10 gage).....	3.89c.
Long terme sheets (No. 24 gage).....	5.80c.
Standard tool steel.....	12.00c.
Wire, black annealed.....	4.50c.
Wire, galvanized annealed.....	5.15c.
Tire steel, 1½ x ½ in. and larger.....	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger.....	3.65c.
Open-hearth spring steel, bases.....	4.50c. to 7.00c.
Machine bolts, cut thread: Per Cent Off List	
¾ x 6 in. and smaller.....	50 to 50 and 10
1 x 30 in. and smaller.....	45 to 50
Carriage bolts, cut thread:	
¾ x 6 in. and smaller.....	60 and 10
¾ x 20 in. and smaller.....	50
Coach screws:	
¾ x 6 in. and smaller.....	50 and 10
1 x 16 in. and smaller.....	50
Boiler Tubes— Per 100 Ft.	
Lap welded steel, 2-in.....	\$17.33
Seamless steel, 2-in.....	20.24
Charcoal iron, 2-in.....	25.00
Charcoal iron, 4-in.....	67.00

## Discounts on Welded Pipe

Standard Steel—	Black	Galv.
1½-in. butt.....	46	29
¾-in. butt.....	51	37
1½-in. butt.....	53	39
2½-6-in. lap.....	48	35
7 and 8-in. lap.....	44	17
11 and 12-in. lap.....	37	12
Wrought Iron—		
1½-in. butt.....	4	+19
¾-in. butt.....	11	+9
1-1½-in. butt.....	14	+6
2-in. lap.....	5	+14
3-6-in. lap.....	11	+6
7-12-in. lap.....	3	+16

## Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box.....	\$6.45	\$6.20
Charcoal, per box—	A	AAA
IC.....	\$9.70	\$12.10
IX.....	12.00	14.25
LXX.....	13.90	16.00

## Terne Plate (14 x 20 in.)

IC—20-lb. coating.....	\$10.00 to \$11.00
IC—30-lb. coating.....	12.00 to 13.00
IC—40-lb. coating.....	13.75 to 14.25

## Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20.....	4.00c.
No. 22.....	4.15c.
No. 24.....	4.20c.
No. 26.....	4.30c.
No. 28*.....	4.45c.
No. 30.....	4.70c.

## Sheets, Galvanized

	Per Lb.
No. 14.....	4.35c. to 4.60c.
No. 16.....	4.45c. to 4.70c.
No. 18.....	4.60c.
No. 20.....	4.75c.
No. 22.....	4.80c.
No. 24.....	4.95c.
No. 26.....	5.20c.
No. 28*.....	5.45c.
No. 30.....	5.85c.

\*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.



tons, and several hundred tons have been added to the road work already pending in New Jersey. The mill price seems to be holding, and if there are concessions from the Youngstown warehouse price they are usually found to be the result of lump sum bids on large tonnages. Prices follow:

*Prices per lb. on billet steel reinforcing bars:* From mill, 2c. Pittsburgh. Out of New York warehouse, 3.15c., delivered at job. Out of Youngstown warehouse, 2.50c., Youngstown, or 2.87½c., delivered New York.

**Cast Iron Pipe.**—Inquiries from private companies are in good volume, but municipal tonnages are still in smaller number than is usual at this season. The 3000 tons of pipe for Boston on which B. Nicoll & Co., New York, quoting on German pipe, submitted a total price of \$149,700, has finally been awarded to the lowest bidder on American made pipe, the Warren Foundry & Pipe Co., which submitted a bid of \$163,392, or \$13,692 higher than the foreign figure. The city of New York is taking contractors' bids involving small lots of water and gas pipe. Prices are fairly steady, with Southern makers holding at about \$37 per ton, Birmingham, but possibly willing to make slight concessions for desirable business.

*Prices per net ton, delivered New York:* Water pipe, 6-in. and larger, \$47.60 to \$48.60; 4-in. and 5-in., \$52.60 to \$53.60; 3-in., \$62.60 to \$63.60; Class A and gas pipe, \$5 extra.

**Warehouse Business.**—Sales from stock during the first few days of April have been at practically the same rate as prevailed throughout March. Orders are small but fairly numerous, and the total tonnage involved, moderate. Black and galvanized sheets are moving well, and there is a sporadic demand for small lots of blue annealed sheets. The new discounts on carriage bolts, cut thread, are 60 and 10 per cent off list for ½ x 6 in. and smaller, and 50 per cent off for ¾ x 20 in. and smaller. Coach screws are 50 and 10 per cent off for ½ x 6 in. and smaller, and 50 per cent off for 1 x 16 in. and smaller.

**Old Material.**—Quietness continues, with only moderate tonnages moving to eastern Pennsylvania consumers, although there is evidently a plentiful supply of all grades of scrap. Brokers' buying prices are substantially unchanged. Recently there has been some export inquiry for heavy melting yard steel from Italy. One dealer in New York is reported to have closed an order for about 1000 tons, and Italian purchasers are said to be negotiating for about 5000 tons. The purchase price offered for this shipment is understood to be about \$10 per ton, f.a.s. New York. During the current week bids on several railroad lists of scrap will be opened, including offerings by the Pennsylvania Railroad, the Erie Railroad, the Central Railroad of New Jersey and the Reading Co. The Pennsylvania list includes 12,000 tons of old rails.

*Dealers' buying prices per gross ton, New York:*

No. 1 heavy melting steel.....	\$11.00 to \$11.85
Heavy melting steel (yard).....	8.25 to 8.50
No. 1 heavy breakable cast.....	11.75 to 13.00
Stove plate (steel works).....	8.50 to 9.00
Locomotive grate bars.....	9.00 to 9.50
Machine shop turnings.....	7.50 to 8.00
Cast borings (blast furnace or steel works).....	8.00 to 8.25
Mixed borings and turnings.....	7.50 to 8.00
Steel car axles.....	16.00 to 16.50
Iron car axles.....	24.00 to 24.50
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	9.25 to 9.75
Forge fire.....	8.00 to 8.50
No. 1 railroad wrought.....	12.50 to 13.50
No. 1 yard wrought, long.....	11.50 to 12.50
Rails for rolling.....	11.50 to 12.00
Cast iron carwheels.....	11.25 to 11.75
Stove plate (foundry).....	10.00 to 10.25
Malleable cast (railroad).....	12.50 to 13.00
Cast borings (chemical).....	12.50 to 13.00

*Prices per gross ton, delivered local foundries:*

No. 1 machinery cast.....	\$15.00 to \$15.50
No. 1 heavy cast (columns, building materials, etc.), cupola size.....	13.50 to 14.00
No. 2 cast (radiators, cast boilers, etc.).....	12.50 to 13.00

**Coke.**—Although the coal strike is in effect, the coke market continues unchanged, with current demand even less than in the previous few weeks. The Connellsville district is reported substantially unaffected, and quotations continue at \$4.50 to \$5 per net ton, ovens, for standard foundry and at \$3.50 to \$3.75 for standard furnace. Delivered prices for foundry coke are: To northern New Jersey, \$8.53 to \$9.03; New

York or Brooklyn, \$9.29 to \$9.79; Newark or Jersey City, N. J., \$8.41 to \$8.91 per net ton. By-product foundry coke ranges from \$9.59 to \$10.77 per net ton, delivered Newark or Jersey City, N. J. The Troy, N. Y., by-product plant is offering screened coke in foundry sizes at \$7.50, ovens.

## Cleveland

### Large Structural Inquiries—Expect 1926 Ore Prices to Be Continued

CLEVELAND, April 5.—The second quarter is starting out with a good volume of new orders for finished steel, although business with some of the mills fell off slightly during the past week. Steel bars continue in very good demand, and plates are moving fairly well in small lots. Structural material is only moderately active. The spring demand for wire products is heavier than a year ago. Sales to jobbers are somewhat lighter than last year, but this decline has been offset by a more active demand from manufacturing consumers. Sheet sales have fallen off, although there are no indications that the consumption has declined. The demand for semi-finished steel is also less active than recently.

The automotive industry appears to be keeping up its recent production schedules but is not buying steel very far ahead. The Cleveland Union Terminals Co. has issued plans for a bridge over the Cuyahoga River as part of the Union Depot project. This will require 16,000 tons of steel. However, bids have not yet been asked for. The Standard Oil Co. of Ohio will take bids shortly for extensions to its Toledo, Ohio, refinery, requiring 4000 tons of steel. In the building field little work is coming out locally, due partly to an unsettled labor situation. The Standard Oil Co. of Indiana has placed an order with the American Shipbuilding Co. for an oil tanker, the third that it has placed with that company in three months. This will require 2000 tons of steel, which will be supplied by the Bethlehem Steel Co.

The market generally has a firm tone. Outside mills are holding to 1.90c., Pittsburgh, for steel bars. A local mill continues to quote bars at 1.90c., Cleveland, but there are still reports that this price is being shaded in some cases. Plates and structural material are holding steadily at 1.90c., Pittsburgh.

**Pig Iron.**—A moderate volume of business is still being taken, although with most consumers covered for the second quarter, sales continue to taper off. Orders for 15,000 tons were taken by Cleveland interests during the week, as compared with 21,000 tons during the previous week. Not much new inquiry is coming out. Prices show virtually no deviation from recent levels. However, in Cleveland the market for outside shipment has a slightly firmer tone, and one furnace that has been on an \$18.50 base for foundry and malleable iron is trying to get somewhat better prices. Another reports small-lot sales at \$19. Brokers who were selling Cleveland iron last week at \$18.25, furnace, have marked their prices up to \$18.50. In the Valley district \$18.50, furnace, is still commonly quoted, so that Cleveland producers cannot take much business at a higher price for competitive points. Lake furnaces outside of Cleveland are on a \$19 base. In Michigan the market is unchanged at \$19.50, furnace. Some ac-

#### Warehouse Prices, f.o.b. Cleveland

	Base per lb.
Plates and structural shapes.....	3.00c.
Soft steel bars.....	3.00c.
Reinforcing steel bars.....	2.75c. to 3.00c.
Cold-finished rounds and hexagons.....	3.65c.
Cold-finished flats and squares.....	4.15c.
Hoops and bands.....	3.65c.
Cold-rolled strip.....	5.95c.
Black sheets (No. 24).....	3.65c.
Galvanized sheets (No. 24).....	4.50c.
Blue annealed sheets (No. 10).....	3.25c.
No. 9 annealed wire, per 100 lb.....	\$2.90
No. 9 galvanized wire, per 100 lb.....	3.35
Common wire nails, base, per keg.....	2.90

\*Net base, including boxing and cutting to length.

tivity has developed in Ohio silvery iron, several contracts having been closed during the week at the schedule. A Tennessee producer has advanced foundry iron 50c. a ton to \$18.50, base Birmingham. March pig iron shipments by most furnaces slightly exceeded production, and shipping orders for April are starting out well, being heavy from the automotive industry.

**Prices per gross ton at Cleveland:**

N'th'n No. 2 fdy., sil. 1.75 to 2.25	\$20.00
Southern fdy., sil. 1.75 to 2.25...	\$24.00 to 24.50
Malleable .....	20.00
Ohio silvery, 8 per cent.....	31.50
Basic, Valley furnace.....	19.00
Standard low phos., Valley furn.	\$27.50 to 28.00

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; \$3 from Jackson, Ohio; \$6 from Birmingham.

**Iron Ore.**—The Ford Motor Co. expects to place orders April 7 for its 1927 ore requirements. Producers have been requested to submit their bids by that time, and all have already sent in their quotations on the Ford inquiry, which was for 385,000 tons of various grades. Last year the market was not established on prices named to the Ford company, although this company paid for a considerable portion of its ore at prices that were set for the season. The Ford business may result in the definite naming of prices this week, or there may be a delay of a week or more in announcing the new prices. The opinion is quite general that the 1926 prices will be reestablished.

**Fluorspar.**—Leading producers are holding to \$18 a ton, mines, for gravel fluorspar, and a Cleveland consumer purchased 500 tons at that price during the week, although there are reports of concessions in other districts.

**Bolts, Nuts and Rivets.**—Consumers appear to be looking favorably on the new bolt and nut price lists, and makers have taken a fair volume of second quarter contracts on the new basis. Specifications for small bolts against first quarter contracts were held up because those bolts were reduced under the new lists, and the unfilled orders will be cancelled. The demand continues very satisfactory. Rivet manufacturers have taken a fair number of contracts for large rivets at the new prices.

**Semi-Finished Steel.**—Specifications for sheet bars, billets and slabs have fallen off somewhat. There has been some additional contracting, and most consumers are now covered either for April or the second quarter. Prices appear to be holding well to \$34, Cleveland, for sheet bars and \$33.50 to \$34 for large billets and slabs. Most buyers of wire rods have closed for the second quarter at \$43, Cleveland.

**Sheets.**—Sales fell off somewhat the past week, and some of the mills are showing more anxiety for orders, although most of the larger mills are comfortably filled with business. While the demand from the automotive industry is holding up to the recent volume, the tonnage coming from that industry is not so heavy as was anticipated. Prices on black and galvanized sheets are weak, but blue annealed sheets are holding rather steady and automobile body sheets are firm. A Cleveland barrel manufacturer has placed a round lot of black sheets at 2.65c., Pittsburgh, which for Nos. 18 to 20 gage means 2.45c., net, or only about \$19 a ton above sheet bars. The common range to other consumers is 2.75c. to 2.80c., Pittsburgh, the lower price being more general. Small lots of galvanized sheets are selling at 3.75c., mill. On blue annealed sheets 2.15c., Pittsburgh, and 2.20c., Ohio mill, are being quoted. Tin mill black plate is selling in this territory at 3c., Pittsburgh.

**Alloy Steel.**—There is a steady and fairly heavy demand from the automotive industry, which continues to order for early requirements. While regular quotations are being generally maintained, a price concession of \$1 a ton from the minimum quotation in the published schedule is reported on good-sized sales from Detroit.

**Strip Steel.**—New demand for cold-rolled strip steel is rather slow, as consumers covered rather heavily before the recent price advance and mills have a good volume of orders on their books. While most producers appear to be holding to 3c., some concessions are reported. Hot-rolled strip steel is in rather light

demand, as consumers are pretty well covered for the second quarter at lower prices than are now quoted. Prices appear to be holding to regular quotations.

**Cold-Finished Steel Bars.**—Prices have been irregular recently, and 2.35c., Cleveland, or \$2 a ton below what has heretofore been the ruling market, has become a rather common quotation.

**Warehouse Business.**—Orders from manufacturing plants show some gain, particularly for steel bars. Ohio manufacturers of road-building machinery are busy and are buying freely. The demand from the building field is light. Sheets are moving rather slowly. Warehouse prices are firm.

**Reinforcing Bars.**—New demand continues light. Prices on rail steel bars are unchanged at 1.75c. to 1.80c., mill.

**Coke.**—Partial suspension of coal mining has had virtually no effect on the foundry coke market. Prices are holding to recent quotations of \$4.25 to \$5.50, Connelville, for standard foundry coke, and \$3.25 to \$3.50 for heating coke. Foundries not having contracts are buying only for early requirements.

**Old Material.**—The demand for steel-making scrap has slowed down the past week, owing to suspensions or rejections of shipments by some of the mills, and buying by dealers has declined, as they are well covered on contracts. As a result, the market has a somewhat weaker tone than a few days ago, although quotations are unchanged generally. Some purchases were made by dealers at \$15.50 for heavy melting steel and at \$11.75 for cast iron borings for delivery to Cleveland consumers. Scrap offered by Detroit automobile companies last week is reported to have brought fair prices. Some of the borings were purchased by Cleveland dealers at \$9.30.

**Prices per gross ton, delivered consumers' yards:**

Basic Open-Hearth Grades	
No. 1 heavy melting steel.....	\$15.25 to \$15.50
No. 2 heavy melting steel.....	14.25 to 14.50
Compressed sheet steel .....	14.00 to 14.50
Light bundled sheet stampings..	12.00 to 12.50
Drop forge flashings .....	14.00 to 14.50
Machine shop turnings .....	9.00 to 9.50
No. 1 railroad wrought .....	11.50 to 12.00
No. 2 railroad wrought .....	14.50 to 15.00
No. 1 busheling .....	12.50 to 12.75
Pipes and flues .....	10.00 to 10.50
Steel axle turnings .....	12.50 to 13.00
Acid Open-Hearth Grades	
Low phosphorus forging crops...	16.50 to 17.00
Low phosphorus, billet bloom and slab crops .....	17.00 to 17.50
Low phosphorus sheet bar crops.	16.00 to 16.50
Low phosphorus plate scrap.....	16.00 to 16.50
Blast Furnace Grades	
Cast iron borings .....	11.50 to 11.75
Mixed borings and short turnings	11.50 to 11.75
No. 2 busheling .....	11.50 to 11.75
Cupola Grades	
No. 1 cast .....	16.00 to 16.50
Railroad grate bars .....	12.00 to 12.50
Stove plate .....	12.00 to 12.50
Miscellaneous	
Railroad malleable .....	15.50 to 16.00
Rails for rolling .....	16.25 to 16.50

## Philadelphia

### Large Sales of Basic Pig Iron—Steel Volume Remains Unchanged

PHILADELPHIA, April 5.—Recent large sales of basic pig iron have helped to strengthen the Eastern pig iron market, and while prices are no higher they are very firm, whereas in some lines of finished steel price weakness continues. An Eastern subsidiary of the Steel Corporation bought 18,000 tons of basic iron, an unusual procedure, as its iron is mostly brought from its own Pittsburgh district furnaces. An independent Eastern steel company bought 15,000 tons of basic. Another pig iron sale of importance was 5000 tons of copper-bearing low phosphorus to a subsidiary of the Baldwin Locomotive Works. The latter company also figures prominently in the week's structural steel market, with an inquiry for 7500 tons of fabricated material for a shop addition at Eddystone, Pa.

The volume of steel sales remains about on a par with that of recent weeks. Reports from local sales offices are not uniform, some mills enjoying fairly sat-



isfactory business, while with others the reverse is the case.

**Pig Iron.**—Although the foundry iron market is dull, the strength which has been gathering in the past two or three weeks has been supported by sales of basic iron totaling 33,000 tons. Comparatively little iron is now available for nearby delivery, with the result that furnaces are not pressing sales but are taking care of regular customers by apportioning such iron as they will be able to ship. There is nothing at the moment to indicate a rise in prices, and in fact there seems no disposition on the part of producers to advance prices so long as coke costs go no higher; but \$21, furnace, is firm for foundry iron, and on carload lots one or two furnaces have obtained 25c. or 50c. more. Freight rate differentials are not being equalized in all cases. In addition to sales of 33,000 tons of basic iron and 5000 tons of low phosphorus iron, previously mentioned, a Virginia cast iron pipe company bought 10,000 tons of foundry iron from a Virginia furnace.

**Prices per gross ton at Philadelphia:**

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	\$21.76 to \$22.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	22.26 to 22.76
East. Pa. No. 1X.	22.76 to 23.26
Basic (delivered eastern Pa.)	20.75 to 21.25
Gray forge	21.00 to 21.50
Malleable	22.50 to 23.00
Standard low phos. (f.o.b. New York State furnace)	25.00
Copper bearing low phos. (f.o.b. furnace)	25.00 to 26.00
Virginia No. 2 plain, 1.75 to 2.25 sil.	26.67
Virginia No. 2X, 2.25 to 2.75 sil.	27.17

Prices, except on low phosphorus, are delivered Philadelphia. Freight rates: 76c. to \$1.64 from eastern Pennsylvania furnaces; \$5.17 from Virginia furnaces.

**Plates.**—The Eastern plate mill situation continues unchanged. With some slight fluctuations, the volume of business keeps at about the level maintained since the first of the year, which gives the mills an operation of about 50 or 60 per cent. Although price concessions are not infrequent on the larger tonnages, 1.90c., Pittsburgh, is the quotation on the general run of orders. Quotations received last week by the Pennsylvania Railroad on 15,000 tons of plates for second quarter were 1.90c., mill, in most cases, but the Wheeling Steel Corporation quoted 1.85c. Chicago mills quoted 2c.

**Structural Shapes.**—Bids have been requested on 7500 tons of fabricated steel for a new shop for the Baldwin Locomotive Works at Eddystone, Pa. Otherwise the local building situation holds out few prospects for large steel tonnage. Most of the jobs are small. The Bonwit-Teller Co. store, taking 1350 tons, will be fabricated by Bethlehem Fabricators, Inc. The Pennsylvania and Reading railroads have awarded a number of bridges. Plain material prices range from 1.80c. to 1.90c., Pittsburgh, for lots of average size, with concessions on larger tonnages. Bids to the Pennsylvania Railroad last week on its second quarter requirements were 1.90c., mill, in every case except that of the Eastern Steel Co., which bid 2c. Chicago mills quoted 2c. also.

**Bars.**—There has been no marked improvement in the rate at which consumers are ordering steel bars. Although the mills are anxious for tonnage, there has been little evidence in this district of shading of prices in an effort to get it. The demand for concrete reinforcing bars is dull for this time of year. Quotations continue at 1.90c., Pittsburgh.

**Sheets.**—The opening of bids by the Pennsylvania Railroad last week on its requirements of sheets for second quarter disclosed the American Sheet & Tin Plate Co. as one of the low bidders, its bid being 2.20c. on blue annealed, 2.80c. on black and 3.65c. on galvanized sheets at mill. The Central Alloy Steel Corporation and the Apollo Steel Co. also quoted these prices. Bids as a whole ranged from 2.20c. to 2.25c. on blue annealed, 2.80c. to 2.90c. on black and 3.65c. to 3.75c. on galvanized. Demand for sheets in the past week has been very light. The local situation is affected to a considerable extent by the unusually scanty requirements of a large fabricator of automobile bodies.

**Imports.**—Last week's imports at Philadelphia included 2500 tons of pig iron from England, 5700 tons of chrome ore from Portuguese East Africa, 211 tons of structural steel from Belgium, 6 tons from Germany.

**Old Material.**—Weakness in No. 1 railroad wrought is the only change in the Eastern scrap situation. Not more than \$17 is obtainable for this grade, and offers of \$16.50, it appeared today, would find takers. Shafting is in slightly better demand at \$19 to \$20.

**Prices per gross ton, delivered consumers' yards, Philadelphia district:**

No. 1 heavy melting steel	\$14.50 to \$15.00
Scrap T rails	14.00 to 14.50
No. 2 heavy melting steel	12.00 to 13.50
No. 1 railroad wrought	16.50 to 17.00
Bundled sheets (for steel works)	12.00
Machine shop turnings (for steel works)	12.00
Heavy axle turnings (or equivalent)	13.50 to 14.00
Cast borings (for steel works and rolling mill)	12.00 to 13.00
Heavy breakable cast (for steel works)	15.50 to 16.00
Railroad grate bars	13.00
Stove plate (for steel works)	13.00
No. 1 low phos., heavy, 0.04 per cent and under	19.00 to 19.50
Couplers and knuckles	17.00 to 17.50
Rolled steel wheels	17.00 to 17.50
No. 1 blast furnace scrap	10.50 to 11.00
Machine shop turnings (for rolling mill)	12.00 to 12.50
Wrought iron and soft steel pipes and tubes (new specifications)	13.50 to 14.00
Shafting	19.00 to 20.00
Steel axles	21.00 to 22.00
No. 1 forge fire	12.00 to 12.50
Steel rails for rolling	16.50 to 17.00
Cast iron carwheels	16.00 to 16.50
No. 1 cast	17.00 to 17.50
Cast borings (for chemical plant)	15.00 to 16.00

## President Clyde Tells of Carnegie's Contribution to the Industry

What was the contribution of Andrew Carnegie and his associates to the steel industry was the subject of an address delivered by William G. Clyde, president Carnegie Steel Co., before the Chamber of Commerce of Pittsburgh on April 5. Besides covering more or less familiar ground, but with a fresh touch that was somewhat unexpected and therefore the more highly appreciated, he dwelt also on how different were the general conditions under which the Carnegie regime prospered than obtain today.

"Whether such a romantic tale of an industry could be enacted these days I have my serious doubts," said Mr. Clyde. "Carnegie had no business ethics to hamper him. Might was right. There was no Sherman law, there was no Interstate Commerce or Federal Trade Commission, no Esch-Townsend railroad bill and no Clayton act; while, as for rebaters, it was a season of high carnival for them. There was no such thing known as 'Government by Commission' in those days. Had Mr. Carnegie to encounter these 'brakes on business,' I am inclined to believe he would have had many troubles."

The steel business grew for Andrew Carnegie because he was able to see its greatness, said Mr. Clyde in another part of his address. "He was able to convince himself at once, what was proved out to everyone later on—that the age of steel was swinging into full tilt; that the great ore beds were there to be converted into iron, thence into the shapes that were needed by mankind. The one great requisite was to produce. That meant work. And Andrew Carnegie worked."

"He builded big and he builded not alone in prosperous times but when the business cycle looked blackest. . . . He never hesitated to scrap a perfectly good piece of machinery when something developed that was an improvement or an aid in cutting the cost of steel production. And so, in a period of approximately thirty-five years, he had builded such a gigantic organization as no one man had heretofore controlled."

Early in the talk, Mr. Clyde pointed out the consummate genius of Carnegie for organization, and "almost on a par with this must be placed his remarkable insight into human nature."

The remarkable story of the developments which culminated in a single company, the Carnegie Steel Co., with an annual output of steel in 1900 of 3,000,000 tons, was an outstanding feature of the address. Especially noteworthy also were the references to the Carnegie associates, particularly "the most spectacular character in the steel industry of all time—Capt. William R. Jones," who developed the inventions of Kelly and Bessemer.

## San Francisco

### Steel Buying Is Light—1000 Tons of Alabama Coke Shipped Through Canal

SAN FRANCISCO, April 2 (By Air Mail).—Among the conspicuous developments of the week have been the arrival at this port of a shipment of 1000 tons of reinforcing bars and small structural shapes from Belgium, the arrival of 1000 tons of Alabama coke, which was shipped via the Panama Canal, and a notable falling off in both buying and inquiry in the heavier forms of steel, especially in plates.

While the situation, generally, in regard to prices is unchanged, Eastern mill quotations on plates have not been tested. Quotations on foreign reinforcing bars and small structural shapes range from 1.70c. to 1.80c., c.i.f. duty paid, San Francisco.

Pig Iron.—Business during the week has been confined to routine developments. Locally, the foundry situation is unsatisfactory, primarily because of the unsettled labor conditions. Quotations on both domestic and foreign pig iron are unchanged.

Prices per gross ton at San Francisco:

*Utah basic .....	\$25.00 to \$26.00
*Utah foundry, sil. 2.75 to 3.25 .....	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25 .....	25.00
**German foundry, sil. 2.75 to 3.25 .....	24.25

\*Delivered San Francisco.

\*\*Duty paid, f.o.b. cars San Francisco.

Shapes.—Lettings in fabricated structural steel for the week totaled 840 tons; fresh inquiry calls for 1506 tons. The largest individual award, 200 tons for an apartment building in Stockton, Cal., was taken by the Seiler Iron Works of that city. In Seattle, Wash., a gymnasium for the University of Washington will require 800 tons. A good deal of small-tonnage work is being figured by local fabricators. Eastern mills quote plain material at 2.35c., c.i.f. Pacific Coast ports.

Plates.—While there is considerable work pending, no lettings of importance have been reported during the week and no fresh inquiries have come out for bids. Eastern mills quote plates at 2.30c., c.i.f. Coast ports.

Bars.—Lettings of reinforcing bars during the week total 1051 tons, and fresh inquiry calls for about 500 tons. The largest individual letting, 215 tons for a high school in Fresno, Cal., was taken by Kyle & Co. of Fresno. The Clipper Co., Oakland, Cal., has been awarded the general contract on the Fruitvale Medical Building in that city, which will require 125 tons of bars. Local reinforcing bar jobbers quote as follows: 2.85c., base per lb. on lots of 200 tons, and 3.10c., base, on less-than-carload lots.

Cast Iron Pipe.—The McWane Cast Iron Pipe Co. has taken 161 tons of 4, 6 and 8-in. pipe for Chehalis, Wash. The city of San Diego, Cal., has placed 40 tons of 6-in. Class B pipe for street improvement work with unnamed companies. Bids have closed on 1407 tons of 4-in. to 12-in., Classes B, C and D pipe for Monterey Park, Cal. B. Nicoll & Co. are low bidders on 1425 tons of 8-in. Class B pipe for Los Angeles. The Grinnell Co. of the Pacific is low bidder on 125 tons of 16-in. Class B pipe for Beverly Hills, Cal. E. Paul Ford, San Diego, Cal., is low bidder on 222 tons of 4, 6 and 12-in. Class C pipe for street improvement work in San Diego. Tacoma, Wash., is taking bids on 236 tons of 6-in. to 16-in., Classes B and C pipe. Los Angeles will open bids April 4 on 107 tons of 6-in. to 10-in. Class B pipe for a storm drain system.

Steel Pipe.—The Ramona Irrigation District, Ra-

#### Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes .....	3.00c.
Soft steel bars .....	3.00c.
Small angles, $\frac{1}{2}$ -in. and over .....	3.40c.
Small angles, under $\frac{1}{2}$ -in. ....	3.60c.
Small channels and tees, $\frac{3}{4}$ -in. to 2 $\frac{1}{4}$ -in. ....	5.00c.
Spring steel, $\frac{1}{4}$ -in. and thicker .....	4.70c.
Black sheets (No. 24) .....	\$3.75
Common wire nails, base per keg .....	3.75
Cement coated nails, 100-lb. keg .....	3.75c.
Blue annealed sheets (No. 10) .....	5.25c.
Galvanized sheets (No. 24) .....	

mona, Cal., will take bids April 19 on about 270 tons of 2 $\frac{1}{2}$ , 4, 6, 8 and 10-in standard pipe.

Warehouse Business.—Buying is light and fresh inquiries, while rather numerous, call for relatively small amounts of steel. Jobbers' quotations are unchanged.

Rails and Track Supplies.—The Southern Pacific Co., San Francisco, will open bids on April 4 on 1980 axles for box cars. The Alaska Railroad, Anchorage, Alaska, has taken bids through its general purchasing agent, Seattle, Wash., on 1000 tons of 90-lb. rails and 2500 pairs of angle bars.

Coke.—A shipment of 1000 tons of Alabama coke arrived at this port during the week. Fresh shipments of German and English coke are expected to arrive in about 30 days. Local sellers quote on specific inquiries only.

## Birmingham

### Tennessee Company Breaks Records for Pig Iron and Steel Production

BIRMINGHAM, April 5.—Business booked in pig iron during the past week has given furnace interests in Alabama encouragement, and plans to curtail production have been abandoned for the time being. Some of the larger melters of iron have purchased against their needs and indicate that they will return to the market a little later. Prices continue on the \$18 per gross ton, Birmingham, for No. 2 foundry, with \$19 being asked on spot shipments. While many smaller melters are keeping busy, their purchases are running as low as one to three cars of iron at a time. Cast iron pressure pipe shops are increasing operations and at the same time are pushing shipments of pipe. Present pig iron bookings and tonnage in prospect indicate that it will be necessary to keep up the current rate of production. Eleven blast furnaces in this State are now on basic, 11 are on foundry, and one is on ferromanganese. Surplus stocks are low. Pig iron output has been stimulated by the heavy demand for steel. The open-hearth furnaces of the Tennessee Coal, Iron & Railroad Co. at Ensley made 300 tons more steel in March than in any other month in its history. The group of blast furnaces at Ensley, six in all, produced 102,000 tons of basic iron in March, breaking the previous monthly record, made in May, 1925. It is estimated that Alabama as a whole produced 8000 tons more iron in the first three months of 1927 than in the same period last year. The new blast furnace of the Sloss-Sheffield Steel & Iron Co. will not be completed and ready for operation until after first week in May. The two new blast furnaces of the Tennessee Coal, Iron & Railroad Co. at Fairfield, which will each have a capacity of 600 tons of basic iron daily, will not be completed until the latter part of year.

Prices per gross ton, f.o.b. Birmingham district furnaces:

No. 2 foundry, 1.75 to 2.25 sil. ....	\$18.00 to \$19.00
No. 1 foundry, 2.25 to 2.75 sil. ....	18.50 to 19.50
Basic .....	18.00
Charcoal, warm blast .....	29.00

Rolled Steel.—Open-hearth furnace operations in the Birmingham district are not much under capacity. The Gulf States Steel Co. has four out of six open-hearth furnaces going, with finishing mills running full. The Tennessee company has virtually all of its open-hearth furnaces active, and no steel is being piled. Rails, track accessories, structural shapes, tank plates and sheets are in good demand. Structural fabricating plants, tank works and welding shops are also busy. Concrete reinforcing bars are being produced and shipped at a steady rate. Mill prices on finished steel are holding their own.

Coke.—Demand continues good for foundry coke, which is holding at \$5.50 to \$6 per net ton, Birmingham, the higher price being quoted on spot shipments. A little beehive coke is still being made and commands \$6 per ton. It is believed here that the strike in the Central States will have to last at least three months before any stimulus in demand will reach outlying



producing sections. By-product coke oven operations in Alabama are at close to capacity.

**Cast Iron Pipe.**—Lettings have been numerous recently, and pressure pipe shops are now well supplied with business. Quotations remain at \$36 to \$37, Birmingham, for 6-in. and larger pipe. Accumulated stocks of pipe will be moved in the next few weeks, as arrangements have been made for several trainload shipments. Business on the books and specifications in sight promise to sustain active operations through the second quarter.

**Old Material.**—With prices unchanged and demand limited mainly to heavy melting steel and No. 1 cast, the scrap market has no new features. Open-hearth furnaces are consuming much heavy melting steel. Pipe shops are taking the major part of the cast, while no small amount of that grade is also being used in blast furnaces.

Prices per gross ton, delivered Birmingham district consumers' yards:

Heavy melting steel	\$12.00 to \$12.25
Scrap steel rails	12.50 to 13.00
Short shoveling turnings	8.00 to 8.50
Cast iron borings	8.00 to 8.50
Stove plate	13.00 to 14.00
Steel axles	16.00 to 17.00
Iron axles	16.00 to 17.00
No. 1 railroad wrought	11.00 to 12.00
Rails for rolling	15.00 to 16.00
No. 1 cast	15.00 to 16.00
Tramcar wheels	15.00 to 16.00
Cast iron carwheels	14.00 to 15.00
Cast iron borings, chemical	13.00 to 14.00

## Cincinnati

### Tennessee Foundry Iron Advances— Cranberry Furnace Blown In

CINCINNATI, April 5.—With pig iron buyers well covered on second quarter requirements and with no indication of an advance in prices in the immediate future, quietness prevails in the local market. Sales in the past week have consisted of scattered lots, ranging from single carloads up to 300 tons, while inquiries have been dull. Following closely the booking of an order for 7000 tons of foundry iron, the Roane Iron Co. has increased its price 50c. a ton to \$18.50, base Birmingham, despite the fact that Alabama producers are offering substantial tonnages at \$18. Resale iron from the Lake Erie district is still available at less than \$18.50, base Cleveland. Foundry iron from the Iron-ton furnaces is being held at \$19.50, base furnace. Demand for Jackson County silvery iron, which was pronounced a week ago, has subsided, and bookings in the past six days have been unimportant. The Cranberry furnace at Johnson City, Tenn., was lighted on March 31 and is now producing low phosphorus iron. There has been no change in malleable iron, the price of which ranges from \$18.50, base Cleveland, in central Ohio, to \$19.50, base Ironton, in the Cincinnati district.

Prices per gross ton, delivered Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	\$21.39 to \$21.89
So. Ohio malleable	20.64 to 21.89
Alabama fdy., sil. 1.75 to 2.25	21.69
Alabama fdy., sil. 2.25 to 2.75	22.19
Tennessee fdy., sil. 1.75 to 2.25	22.19
Southern Ohio silvery, 8 per cent	30.39

Freight rates: \$1.89 from Ironton and Jackson, Ohio; \$3.69 from Birmingham.

**Finished Material.**—The market has a slightly weaker tone, although sellers regard this development as merely temporary. With contract buyers of bars and structural steel in a position to specify against their needs at any time in the next 30 to 60 days at the prevailing price of 1.90c., base Pittsburgh, the tendency is to postpone the placing of specifications until consumers can ascertain the turn that business is likely to take during the spring months. Some mills are trying to obtain 2c. per lb. on small tonnages, and in a few instances have been successful in booking single carloads at that figure. While sheet producers have sold large quantities of material in the last two or three weeks, the price situation is far from being satisfactory. Galvanized and black are being quoted at 3.75c. and 2.80c., base Pittsburgh, respectively, al-

though several companies are adhering to quotations \$2 a ton higher. Blue annealed stock is firm at 2.25c. to 2.30c., base Pittsburgh. Sheet mills in this district are operating at about 95 per cent of capacity, and bookings ahead are sufficient to insure a continuation of production on the present basis for a period of from two to three weeks. Shipments to several important automobile makers in Detroit still constitute a considerable portion of the total tonnage. A slight improvement in the wire goods market is noted. Consumers are showing more interest, and jobbers have been buying at a fair rate. Common wire nails are quoted at \$2.55 per keg, base Pittsburgh, but deliveries are being made to Ohio River points by an Ironton, Ohio, mill at a lower price. Although building awards in this territory have been greater than those in the early part of 1926, there has been a dearth of sizable structural steel jobs. Consequently local fabricators have been compelled to turn their efforts to small work.

**Warehouse Business.**—The volume of business in the past week reached fair proportions, although several jobbers declare that sales are below normal for this time of the year. Orders for bars and structural steel have held up to a satisfactory level, but cold-rolled steel is less active. There have been no changes in quotations, which are firm.

**Old Material.**—Few sales have been made in the past week. A Portsmouth, Ohio, steel plant is reported to have been inquiring for 10,000 tons of heavy melting steel for shipment over the next 60 days, but was unwilling to pay the price which dealers are asking. Quotations in general are firm.

Dealers' buying prices per gross ton, f. o. b. cars, Cincinnati:

Heavy melting steel	\$13.00 to \$13.50
Scrap rails for melting	13.50 to 14.00
Loose sheet clippings	9.50 to 10.00
Champion bundled sheets	10.50 to 11.00
Cast iron borings	10.00 to 10.50
Machine shop turnings	9.50 to 10.00
No. 1 busheling	10.50 to 11.00
No. 2 busheling	7.50 to 8.00
Rails for rolling	14.00 to 14.50
No. 1 locomotive tires	16.50 to 17.00
No. 1 railroad wrought	11.00 to 11.50
Short rails	17.50 to 18.00
Cast iron carwheels	13.00 to 13.50
No. 1 machinery cast	18.00 to 19.00
No. 1 railroad cast	14.50 to 15.00
Burnt cast	8.50 to 9.00
Stove plate	10.00 to 10.50
Brake shoes	10.50 to 11.25
Railroad malleable	14.50 to 15.00
Agricultural malleable	13.50 to 14.00

**Coke.**—Suspension of coal mining in the unionized bituminous fields has failed to disturb the local coke market. In many cases consumers have stocked in anticipation of a strike and, under the circumstances, will not need to replenish their supply for a number of weeks. As a result, the demand for foundry coke has declined. Dealers believe that specifications for by-product foundry grades will slump considerably this month. As predicted last week, the price of by-product domestic coke dropped \$1.50 a ton on April 1. Two important sellers are asking \$5, f.o.b. ovens, for egg, but a third company is soliciting business in both egg and walnut at \$4.50. The bulk of the tonnage that has been placed is said to have gone on the lower basis. It is understood that by-product ovens in the Ironton

### Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes	3.40c.
Bars, soft steel or iron	3.30c.
Reinforcing bars	3.30c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares	4.35c.
Open-hearth spring steel	4.75c. to 5.00c.
Black sheets (No. 24)	4.05c.
Galvanized sheets (No. 24)	4.90c.
Blue annealed sheets (No. 10)	3.60c.
Structural rivets	3.85c.
Small rivets	.65 per cent off list
No. 9 annealed wire, per 100 lb.	\$3.00
Common wire nails, base per keg	2.95
Cement coated nails, base per 100 lb. keg	3.05
Chain, per 100 lb.	7.55
Net per 100 Ft.	
Lap welded steel boiler tubes, 2-in.	\$18.00
4-in.	38.00
Seamless steel boiler tubes, 2-in.	19.00
4-in.	39.00

district have large stocks of domestic grades on hand. At Detroit, by-product ovens recently reduced from 75c. a ton to 50c. the charge that is added to the oven prices for local delivery. Beehive coke from New River and Wise County producing centers is moving at a moderate pace.

*Foundry coke prices per net ton, delivered Cincinnati:* By-product coke, \$9.52 to \$9.64; Wise County coke, \$7.59 to \$8.09; New River coke, \$10.09 to \$10.59. Freight rates: \$2.14 from Ashland, Ky.; \$2.59 from Wise County and New River ovens.

## St. Louis

### Record Shipments of Plates and Sheets From Local Mill in March

ST. LOUIS, April 5.—Sales of pig iron by the Granite City maker during the last week totaled approximately 3000 tons of foundry grades for second quarter delivery. However, better business is in prospect, as several important inquiries are pending which, if placed, will take up 10,000 to 20,000 tons. A leading Southern maker reports a fair amount of business with stove foundries in the district. The melt in the district is fair, with some melters reporting an increase and others a decrease. Prices are unchanged.

*Prices per gross ton at St. Louis:*

No. 2 fdy., sil. 1.75 to 2.25, f.o.b.	
Granite City, Ill.	\$20.50 to \$21.00
Northern No. 2 fdy., delivered	
St. Louis	22.16
Southern No. 2 fdy., del'd.	22.42
Northern malleable, delivered	22.16
Northern basic, delivered	22.16

Freight rates: 81c. from Granite City to St. Louis; \$2.16 from Chicago; \$4.42 from Birmingham.

**Finished Iron and Steel.**—The National Enameling & Stamping Co. reports that its shipments of plates and sheets during March were the largest of any month in the history of its business, being 8 per cent greater than for March last year. The buying was from the oil fields, railroads and miscellaneous interests. The plant is running at about 95 per cent of normal capacity. Prices are firm and unchanged. Buying of structural steel is light. Business in Arkansas and Tennessee is affected adversely by heavy rains. Warehouse trade is slightly better.

**Coke.**—The local by-product company is quoting \$10.25, ovens, for foundry grades, and \$11 for egg size and \$10.50 for domestic furnace size, delivered St. Louis. The demand for industrial coke is only fair. No heavy buying was stimulated by apprehension of the coal strike, as the local oven assured its customers that they would be taken care of. Domestic coke is dull.

**Old Material.**—The market situation is unchanged, but dealers feel that they will have to pay higher prices soon in order to meet Chicago quotations, as country dealers in Indiana and Iowa logically tributary to St. Louis have been shipping to Chicago more advantageously. Railroad lists closing here next week are expected to bring better prices than now prevail. Railroad offerings include: Pennsylvania, 54,780 tons; Baltimore & Ohio, 24,000 tons; Missouri Pacific, 6800

### Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-finished rounds, shafting and screw stock	3.75c.
Black sheets (No. 24)	4.45c.
Galvanized sheets (No. 24)	5.25c.
Blue annealed sheets (No. 10)	3.60c.
Black corrugated sheets	4.65c.
Galvanized corrugated sheets	5.30c.
Structural rivets	3.65c.
Bolter rivets	3.85c.
	Per Cent Off List
Tank rivets, 7/16-in. and smaller	70
Machine bolts	50 and 5
Carriage bolts	47 1/2
Lag screws	55 and 5
Hot-pressed nuts, square, blank or tapped	3.25c. off per lb.
Hot-pressed nuts, hexagons, blank or tapped	3.75c. off per lb.

tons; St. Louis-San Francisco, 400 tons; Midland Valley, 450 tons, and Wabash, 230 tons.

*Prices per gross ton f.o.b. dealers' yards and delivered St. Louis district consumers' works:*

Heavy melting steel	\$12.25 to \$12.75
Heavy shoveling steel	12.25 to 12.75
Miscellaneous standard section rails, including frogs, switches and guards, cut apart	13.00 to 13.50
Railroad springs	14.00 to 14.50
Bundled sheets	9.00 to 9.50
No. 2 railroad wrought	12.25 to 12.75
No. 1 bushing	10.00 to 10.50
Cast iron borings	9.00 to 9.50
Iron rails	14.00 to 14.50
Rails for rolling	14.50 to 15.00
Machine shop turnings	9.75 to 10.25
Steel car axles	19.75 to 20.25
Iron car axles	23.25 to 23.75
Wrought iron bars and transoms	19.75 to 20.25
No. 1 railroad wrought	11.25 to 11.75
Steel rails, less than 3 ft.	16.00 to 16.50
Steel angle bars	13.00 to 13.50
Cast iron carwheels	14.00 to 14.50
No. 1 machinery cast	17.00 to 17.50
No. 1 railroad cast	15.00 to 15.50
Railroad malleable	14.00 to 14.50
Agricultural malleable	13.50 to 14.00
Relaying rails, 60 lb. and under	20.50 to 23.50
Relaying rails, 70 lb. and over	26.50 to 29.00

## Boston

### Boston Buys 3000 Tons of American Pipe —Pig Iron Sales Small

BOSTON, April 5.—It has been a rather uneventful week in the pig iron market. Recent and current sales represent minimum tonnages and have brought out no changes in prices for ordinary foundry grades. Furnaces east of Buffalo continue to book larger tonnages than do Buffalo, Pennsylvania, Virginia and Alabama producers. A Boston foundry has bought 250 tons of 5 to 6 per cent silicon iron at less than \$26.75, delivered. Scotch iron has been offered here at \$27.75 a ton on dock. Foundries are taking contract iron about on schedule. The Mystic Iron Works in the past week has shipped 3000 tons in two barge lots to a Philadelphia district pipe manufacturer. There is a noticeable swing by New England kitchen range manufacturers from castings to sheet steel, owing to an increasing use of gas as a cooking fuel. Textile machinery makers take an optimistic view of late 1927 and early 1928 business. Until then they are not likely to be important factors in pig iron buying.

*Prices of foundry iron per gross ton, delivered in most New England points:*

Buffalo, sil. 1.75 to 2.25	\$22.16 to \$22.91
Buffalo, sil. 2.25 to 2.75	22.66 to 23.16
East. Penn., sil. 1.75 to 2.25	24.15 to 24.65
East. Penn., sil. 2.25 to 2.75	24.65 to 25.15
Virginia, sil. 1.75 to 2.25	26.92 to 27.42
Virginia, sil. 2.25 to 2.75	27.42 to 27.92
Alabama, sil. 1.75 to 2.25	24.91 to 26.77
Alabama, sil. 2.25 to 2.75	25.41 to 27.27

Freight rates: \$4.91 from Buffalo, \$3.65 from eastern Pennsylvania, \$5.92 from Virginia, \$6.91 to \$8.77 from Alabama.

**Cast Iron Pipe.**—Boston has awarded to the Warren Foundry & Pipe Co. 200 tons of 6-in. pipe, 700 tons of 8-in., 1500 tons of 12-in. and 600 tons of 16-in., a total of 3000 tons. Bids on this business were taken twice and in each instance German pipe interests submitted the lowest bid and the Warren Foundry & Pipe Co., the low American bid. The first bids were rejected. When the second bids were made known, showing a difference of \$13,692 between the total prices of American and German pipe, a storm of protest arose from labor unions. In addition, Boston is noted for its rigid pipe specifications, and city departments recommended to the mayor that American pipe be given preference over German. The Metropolitan District Water Board, Boston, will receive bids until April 15 for furnishing and laying approximately 2300 tons of 30-in. pipe or about 9000 ft. of cement pipe. Prices quoted openly on domestic pipe are: 4-in., \$58.10 a ton, delivered common Boston freight rate points; 6 to 12-in., \$53.10 to \$54.10; larger pipe, \$52.10 to \$53.10. A \$5 differential is asked on Class A and gas pipe.

**Coke.**—The New England Coal & Coke Co. and the Providence Gas Co. announce no change this month in the price of by-product foundry coke, sales being on a basis of \$12.50 a ton, delivered, within a \$3.10 freight



rate zone. Good Connellsville district foundry fuel is still offered at \$11 a ton, delivered in New England. Both New England coke makers are endeavoring to secure more specifications against contracts, but foundries continue to take fuel on a hand-to-mouth basis. Stocks of fuel at ovens are accumulating.

**Old Material.**—Prices for steel mill material continue flexible. For instance, heavy melting steel fluctuates within an average range of about 25c. a ton. Just now it is down that much from the level of a week ago. Both scrap rails and rails for rerolling are lower this week, there being little immediate call for them. Wrought is easier for the same reason, particularly yard wrought. On the other hand, street car axles and long bundled skeleton are higher in price, owing to good buying. There is a normal amount of old material moving out of New England, but on an unprofitable basis for the broker. In most instances he pays the limit for material, while the consumer is exacting as to prices and quality.

*Buying prices per gross ton, f.o.b. Boston rate shipping points:*

No. 1 heavy melting steel.....	\$10.25 to \$10.50
Scrap rails .....	9.75 to 10.00
No. 1 railroad wrought.....	11.50 to 11.75
No. 1 yard wrought.....	9.50 to 9.75
Machine shop turnings.....	6.75 to 7.00
Cast iron borings (steel works and rolling mill).....	6.85 to 7.50
Bundled skeleton, long.....	7.50 to 8.00
Forged flashings .....	7.50 to 8.00
Blast furnace borings and turnings .....	6.00 to 6.50
Forged scrap .....	7.00 to 7.50
Shafting .....	14.50 to 15.00
Street car axles.....	17.00 to 18.00
Wrought pipe (1 in. in diameter, over 2 ft. long).....	8.50 to 9.00
Rails for rerolling.....	11.00 to 11.50
Cast iron borings, chemical.....	10.50 to 11.00

*Prices per gross ton, delivered consumers' yards:*

Textile cast .....	\$17.00 to \$17.50
No. 1 machinery cast.....	16.50 to 17.00
No. 2 machinery cast.....	15.00 to 15.50
Stove plate .....	12.50 to 13.00
Railroad malleable .....	16.00 to 16.50

## Toronto

### Heavy Demand for Pig Iron—Scrap Buying Is in Good Volume

TORONTO, ONT., April 5.—The placing of contracts has been the feature of the Canadian pig iron markets during the past week or two. Melters who put off to the last moment in making known their second quarter needs have been hastening to cover for this period, with the result that local blast furnace representatives have done a record business. It is understood that there is between 5000 and 10,000 tons still pending, which is expected to be closed during the next fortnight. In addition to heavy buying for future delivery, selling agents state that spot demand has also improved since the first of March and that prospects are good for continued strong demand for foundry and malleable iron throughout the present quarter. Most consumers have little iron in stock. Prices remain firm, but until higher quotations appear in United

#### Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates .....	3.365c.
Structural shapes—	
Angles and beams.....	3.365c.
Tees .....	3.365c.
Zees .....	3.465c.
Soft steel bars and small shapes.....	3.265c.
Flats, hot-rolled .....	4.15c.
Reinforcing bars .....	3.265c. to 3.54c.
Iron bars—	
Refined .....	3.265c.
Best refined .....	4.60c.
Norway, rounds .....	6.60c.
Norway, squares and flats.....	7.10c.
Spring steel—	
Open-hearth .....	5.00c. to 10.00c.
Crucible .....	12.00c.
Tire steel .....	4.50c. to 4.75c.
Bands .....	4.015c. to 5.00c.
Hoop steel .....	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hexagons.....	4.05c.
Squares and flats.....	4.55c.
Toe calk steel.....	6.00c.

States markets there is little prospect of any general advance in Canadian prices.

*Prices per gross ton:*

Delivered Toronto	
No. 1 foundry, sil. 2.25 to 2.75.....	\$24.10
No. 2 foundry, sil. 1.75 to 2.25.....	24.10
Malleable .....	24.10

Delivered Montreal	
No. 1 foundry, sil. 2.25 to 2.75.....	26.50
No. 2 foundry, sil. 1.75 to 2.25.....	26.50
Malleable .....	26.50
Basic .....	25.50

Imported Iron at Montreal Warehouse	
Summerlee .....	36.00
Carron .....	36.00

**Old Material.**—The movement of old material between dealers and consumers has improved. This is due chiefly to the fact that consumers have only small tonnages on hand and their consumptive needs are increasing, owing to a stronger demand for finished products. Scrap sales for the week were again heavier than those of the previous week, with more interest reported both in spot and future business. The greater part of current demand is from consumers in the Hamilton, Ont., district, where large quantities of heavy melting steel, turnings, etc., are required by the mills. Foundries throughout Ontario and Quebec are also buying more extensively, but there has been practically no change in export demand of late. Prices are showing a stronger tendency, with some dealers offering slightly above market for select tonnages of heavy melting steel, but the improvement in demand has not warranted any general upward revision in prices. Trading between dealers is also more active and producers are showing a stronger tendency to dispose of their holdings, even at the prevailing low prices.

*Dealers' buying prices:*

	Toronto	Montreal
Per Gross Ton		
Heavy melting steel.....	\$10.50	\$9.00
Rails .....	11.00	10.00
No. 1 wrought.....	11.00	14.00
Machine shop turnings.....	8.00	7.50
Boiler plate .....	8.00	8.00
Heavy axle turnings.....	8.50	8.50
Cast borings .....	8.50	7.50
Steel turnings .....	8.00	8.00
Wrought pipe .....	6.00	6.00
Steel axles .....	15.00	17.00
Axles, wrought iron.....	17.00	19.00
Per Net Ton		
No. 1 machinery cast.....	16.00	18.00
Stove plate .....	10.00	13.00
Standard carwheels .....	14.00	16.00
Malleable scrap .....	14.00	14.00

## Buffalo

### Pig Iron Grows Stronger as Demand Tapers—Mills Operate at High Rate

BUFFALO, April 5.—Demand for pig iron has tapered, with about 6000 to 7000 tons representing the amount now pending. One of the inquiries is for 2000 tons of foundry and malleable. Two other inquiries call for 600 tons and 400 tons of foundry, respectively. A local maker has booked 500 tons of foundry at \$18, base. Another furnace interest, which has been quoting \$17.25, has increased its base to \$17.75, naming \$18.25 on No. 2X foundry and \$19.50 on No. 1X foundry. A \$1.25 spread will be noticed between the two higher grades. A little third quarter iron has been sold on the \$17.75, base. Some iron is still being offered at as low as \$17.50, base. The majority of the Buffalo furnaces are quoting \$18, base, however.

*Prices per gross ton, f.o.b. Buffalo furnace:*

No. 2 plain fdy., sil. 1.75 to 2.25.....	\$17.50 to \$18.00
No. 2X foundry, sil. 2.25 to 2.75.....	18.00 to 18.50
No. 1X foundry, sil. 2.75 to 3.25.....	19.00 to 19.50
Malleable, sil. up to 2.25.....	17.50 to 18.00
Basic .....	17.00 to 18.00
Lake Superior charcoal.....	27.28

#### Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes.....	3.40c.
Soft steel bars.....	3.30c.
Cold-finished shapes.....	4.45c.
Rounds .....	3.95c.
Black sheets (No. 24).....	4.30c.
Galvanized sheets (No. 24).....	5.15c.
Blue annealed sheets (No. 10).....	3.80c.
Common wire nails, base per keg.....	\$3.90
Black wire, base per 100 lb.....	3.90

**Finished Iron and Steel.**—Demand for bars and shapes is good, and prices are firm. Reinforcing bar interests have been informed of a postponement of the Victor Building project, a 400-ton job, owing to determination of a change in plans. A decision has been made to proceed with the Millard Fillmore Hospital addition, a 100-ton job which had been held up. A local maker has taken the contract to furnish the bars and metal strips for a road near Olean, N. Y., requiring 300 tons, and, in addition, has booked two 100-ton construction jobs. Demand for sheets has strengthened, but prices show little evidence of stiffening. Prices on black sheets are between 2.75c. and 2.90c., base Pittsburgh. The Lackawanna plant of the Bethlehem Steel Corporation is operating 19 out of 24 open-hearth furnaces, and Donner Steel Co., seven out of 10. The Wickwire-Spencer Steel Co. is operating at about 75 per cent and the Seneca Iron & Steel Co., at 85 to 90 per cent of capacity.

**Old Material.**—Several railroad lists are out and will probably be closed some time this week. A Michigan Central list closed the latter part of last week. The small portion of it that came to Buffalo brought about \$16.50, delivered consuming plant. No action has been yet taken on the two 2000-ton inquiries for heavy melting steel noted last week. Old orders for mills have practically all been completed. The demand for low phosphorus has kept up, and the aggregate sales have been large. There has been considerable selling of No. 1 cast at prices around \$16. A sale of No. 1 railroad cast was made at \$17. Cast scrap is rather scarce, with no large tonnages available. Mills,

as well as dealers, are watching the effect of the coal strike on the market.

*Prices per gross ton, f.o.b. Buffalo consumers' plants:*

Basic Open-Hearth Grades	
No. 1 heavy melting steel.....	\$16.00 to \$16.50
No. 2 heavy melting steel.....	15.00 to 15.50
Scrap rails .....	16.00 to 16.50
Hydraulic compressed sheets....	14.50 to 15.00
Hand-bundled sheets .....	11.00 to 11.50
Drop forge flashings.....	13.00 to 13.50
No. 1 busheling.....	15.00 to 15.50
Heavy steel axle turnings.....	14.00 to 14.50
Machine shop turnings.....	9.00 to 9.50

Acid Open-Hearth Grades	
Railroad knuckles and couplers..	17.50 to 18.00
Railroad coil and leaf springs...	17.50 to 18.00
Rolled steel wheels.....	17.50 to 18.00
Low phosphorus billet and bloom ends .....	17.50 to 18.00

Electric Furnace Grades	
Heavy steel axle turnings.....	14.00 to 14.50
Short shoveling steel turnings..	11.50 to 12.00

Blast Furnace Grades	
Short shoveling steel turnings..	11.50 to 12.00
Short mixed borings and turnings	10.00 to 10.50
Cast iron borings.....	11.00 to 11.50
No. 2 busheling.....	13.00 to 13.50

Rolling Mill Grades	
Steel car axles.....	17.00 to 17.50
No. 1 railroad wrought.....	13.00 to 13.50

Cupola Grades	
No. 1 machinery cast.....	16.50 to 17.00
Stove plate .....	14.00 to 14.50
Locomotive grate bars.....	13.00 to 13.50
Steel rails, 3 ft. and under.....	18.00 to 18.50
Cast iron carwheels.....	15.00 to 16.00

Malleable Grades	
Railroad .....	16.50 to 17.00
Agricultural .....	16.50 to 17.00
Industrial .....	16.50 to 17.00

## DISCUSS SCRAP RATES

### Dealers, Consumers and Railroads Seek Interpretation of Commerce Commission Ruling

WASHINGTON, April 5.—Determination of what is and should be iron and steel scrap within the meaning of railroad rate classification was the subject of an all-day conference today, which was attended by about 35 representatives of the railroads, iron and steel companies and scrap dealers. At the meeting it was decided to name a committee of four consumers, three dealers and four railroad representatives, with the possibility of later selecting another railroad representative as a vendor of scrap.

The railroads will select their representatives later. Consumers selected for the committee are: Murray H. Billings, assistant traffic manager, Illinois Steel Co., chairman; H. D. Rhodehouse, traffic manager, Youngstown Chamber of Commerce, Youngstown; W. J. Hammond, traffic manager, Inland Steel Co., Chicago; and E. R. Griffith, traffic manager, Sharon Steel Hoop Co., Sharon, Pa. Dealers on the committee are: A. L. Dreher, traffic manager, Hyman-Michaels Co., Chicago; H. F. Massman, traffic department, National Association of Waste Material Dealers, and H. R. DeGroat, A. M. Wood Co.

The committee will call a meeting, probably in Chicago, at which the many questions involved will be discussed. The conclusions will be reported and a further meeting will be held with the railroads.

The meeting today grew out of a hearing in New York in January, occasioned by the confusion as to the rate classification of scrap which arose from the decision of the Interstate Commerce Commission in a recent case with the Southern Railway. To come within the description given in the decision, "scraps or pieces of iron or steel having value for remelting purposes only," it was found that the articles must be shipped in their original form but must be so reduced into fragments, scraps or pieces as to be useless for any purposes other than melting.

This ruling was found to be extremely perplexing and the many points brought out at the meeting made it clear that it will be difficult to meet it literally. The committee will endeavor to frame a description which will be broader and may confer during its conferences with Director W. V. Hardie, of the Interstate Commerce Commission, to obtain his views as to the probable interpretation by the commission.

One of the points brought out was that while material may be purchased at a given point as scrap, even including old plants, some of it might be sold as machinery and therefore not come within the description of scrap. Also, as in the case of old rails, they might be purchased as scrap, yet be shipped to a mill for reheating and rerolling and not for "remelting purposes only."

### Higher Prices Asked for Fire Clay and Silica Brick

PITTSBURGH, April 4.—An advance in prices has been made by practically all makers of fire clay and silica brick. Excepting New Jersey fire clay brick, the prices of first quality brick of this kind are now \$43 to \$46 per 1000 in all producing States from Missouri east, or \$3 per 1000 more than recently has been quoted. First quality New Jersey fire clay brick is now quoted at \$50 to \$65, this range representing a slight reduction from recent published quotations, which, however, had been subject to some shading. The advance in silica brick does not apply to the Southern product, which remains as formerly at \$50 per 1000, f.o.b. Birmingham.

As part of the revision is an announcement by several manufacturers of a discontinuance of the production of a grade of fire clay brick that was better than second quality but not good enough to be classified as first quality. This intermediate grade could be made almost as good as first quality brick, but the sale of refractory brick by brands instead of analysis has persisted and those that were commonly regarded as below first quality had to be sold for less than the first quality prices and, because they answered the purpose, offered strong competition with the accepted first quality brands.

The advance in prices in first quality brick has been accompanied by a cut of \$2 to \$3 per 1000 in the prices of the next best grade, which now takes a range of \$35 to \$38 per 1000 from the various producing districts. At these prices a grade will be available that will be serviceable in all uses except those where high temperatures would mean excessive spalling unless the best available fire clay bricks were used. The second quality classification, as used in connection with the quotations, does not include a grade that usually is referred to as "second quality" but sells from \$22 to \$26 per 1000.



## FABRICATED STRUCTURAL STEEL

### Several Large Projects Swell Pending Work to About 54,000 Tons

Inquiries for structural steel this week are much more impressive in volume than the awards. The latter total less than 25,000 tons, while inquiries are about 54,000 tons, including 16,000 tons for a bridge at Cleveland, 9000 tons for subway work in New York, 6000 tons for oil tanks in Texas, 7500 tons for a locomotive shop at Eddystone, Pa., and 5000 tons for a municipal viaduct in New York. The largest award was 6100 tons for oil tanks in Oklahoma. Awards follow:

NEW YORK, 600 tons, bank and office building, 340 Madison Avenue; column cores, loft building, Varick and Vandam Streets, and factory building, Meadow and Bogart Streets, Brooklyn, all to Levering & Garrigues Co.  
 NEW YORK, 480 tons, loft building, 244 West Thirty-ninth Street, to Easton Structural Steel Co.  
 NEW YORK, 350 tons, apartment building, 19 West Forty-fourth Street, to Easton Structural Steel Co.  
 NEW YORK, 100 tons, addition to Court House, 161st Street and Washington Avenue, to Reliance Steel Fabricators, Inc.  
 NEW YORK, 200 tons, theater and office building, Castle Hill and Westchester Avenues, to Kues Brothers.  
 NEW YORK, 450 tons, Studio Club on East Seventy-seventh Street, to McClintic-Marshall Co.  
 NEW YORK, 550 tons, loft building on West Forty-sixth Street, to Harris Structural Steel Co.  
 NEW YORK, 1400 tons, Bronx Service Station, to Hedden Iron Construction Co.  
 NEW YORK, 1000 tons, loft building, West Twenty-seventh Street, to Hinkle Steel Construction Co.  
 READING RAILROAD, 100 tons, bridge at Somerton, Pa., to Shoemaker Bridge Co.  
 PENNSYLVANIA RAILROAD, 450 tons, four bridges, to Bethlehem Steel Co.  
 WILMINGTON, DEL., 125 tons, Homeopathic Hospital, to American Fabricated Steel Co.  
 SCRANTON, PA., 1450 tons, Masonic Temple, to McClintic-Marshall Co.  
 PHILADELPHIA, 1350 tons, store building for Bonwit-Teller Co., to Bethlehem Fabricators, Inc.  
 PHILADELPHIA, 100 tons, bridge over Pickering Creek for the Philadelphia Suburban Water Co., to Phoenix Bridge Co.  
 BANGOR & AROOSTOOK RAILROAD, 200 tons, bridge at Derby, Me., to Phoenix Bridge Co.  
 AYER, MASS., 500 tons, transmission towers for New England Power Construction Co., to American Bridge Co.  
 ATLANTA, GA., 600 tons, transmission towers for Georgia Railway & Power Co., to American Bridge Co.  
 ROCHESTER, N. Y., 2000 tons, Masonic Temple, to F. L. Hughes Co.  
 CHICAGO, 600 tons, Garfield State Bank, to American Bridge Co.  
 FAR ROCKAWAY, N. Y., 250 tons, store and office building, to Kues Brothers.  
 HACKENSACK, N. J., 120 tons, garage and service station, First and Atlantic Streets, to Foscale Iron Works, 56 Adams Street, Guttenburg, N. J.  
 DENVER, N. J., 300 tons, St. Francis Sanitarium, to Albert Smith & Sons, Inc.  
 SEWAREN, N. J., 100 tons, shop, to Beers-Tapman, Inc., 15 Park Row, New York.  
 PHILADELPHIA, 175 tons, Green Lane bridge, to McClintic-Marshall Co.  
 PHILADELPHIA, 225 tons, garage, to McClintic-Marshall Co.  
 BALTIMORE, 1250 tons, Federal Reserve Bank, to Lehigh Structural Steel Co.  
 ERIE RAILROAD, 150 tons, bridges, to American Bridge Co.  
 FLORIDA EAST COAST RAILROAD, 425 tons, bridges, to unnamed fabricator.  
 FALMOUTH, KY., 200 tons, highway bridge for Kentucky State Highway Commission, to Vincennes Bridge Co.  
 CHICAGO, 200 tons, transmission structures for the Commonwealth Edison Co., to Vierling Steel Works, Chicago.  
 KENOSHA, WIS., 360 tons, Kenosha Theater, to Lakeside Bridge & Steel Co., North Milwaukee, Wis.  
 MILWAUKEE, 220 tons, manufacturing addition for LeRol Co., gasoline engines, to Lakeside Bridge & Steel Co.  
 ST. LOUIS, 380 tons, 20 barges for United States Army Engineers, to Howard Ship Yards.  
 BARTLESVILLE, OKLA., 6100 tons of tank plates for the Illinois Oil Co., to an unnamed fabricator.  
 PORTLAND, ORE., 190 tons, skids for the Lidgerwood Pacific Co., to Wallace Bridge & Structural Steel Co., Seattle.  
 PORT ANGELES, WASH., 175 tons, pulp plant for the Washington Pulp & Paper Co., to Isaacson Iron Works, Seattle.  
 STOCKTON, CAL., 200 tons, apartment building, to Seller Iron Works, local.  
 SHELLVILLE, CAL., 100 tons, Shellville bridge in Sonoma County, to Pacific Coast Engineering Co., Oakland.

OAKLAND, CAL., 175 tons, warehouse for the General Electric Co., to California Steel Co., San Francisco.

### Structural Projects Pending

Inquiries for fabricated steel work include the following:

SALEM, MASS., 100 tons, high school addition.  
 BOSTON & MAINE, 600 tons, bridges.  
 NEW YORK CENTRAL, 150 tons, bridges.  
 SOUTHERN RAILWAY, 1025 tons, bridges.  
 NEW YORK, 5000 tons, municipal viaduct on Riverside Drive at 155th Street.  
 NEW YORK, 9000 tons, section I, route 101, subway under Fulton Street, Manhattan.  
 CINCINNATI, 200 tons, addition to Second National Bank Building; bids in.  
 SPRINGFIELD, OHIO, tonnage unknown, building for Ohio Bell Telephone Co.; bids close April 12.  
 OAKWOOD, MICH., 800 tons, bridge for the Wabash Railroad.  
 PORT ARTHUR, TEX., 6000 tons, tanks for the Gulf Refining Co.  
 OKLAHOMA CITY, OKLA., 700 tons, building for the Oklahoma Gas & Electric Co.  
 SEATTLE, WASH., 800 tons, gymnasium, University of Washington; John Arlington, Seattle, low bidder on general contract.  
 SAN FRANCISCO, 300 tons, pier sheds; bids April 8.  
 SAN FRANCISCO, 106 tons, pier and equipment for a municipal garbage dump; bids soon.  
 SAN FRANCISCO, 300 tons, apartment building at Scott and Fulton Streets.  
 EDDYSTONE, PA., 7500 tons, shop D for the Baldwin Locomotive Works.  
 GREEN BANK, N. J., 100 tons, bascule bridge.  
 CAMDEN, N. J., 800 tons, Galen Building.  
 ADDISON, OHIO, 440 tons, coal trestle and crane runway for United States Cast Iron Pipe & Foundry Co.  
 CLEVELAND, 16,000 tons, Cleveland Union Terminals Co., bridge over the Cuyahoga River.  
 TOLEDO, OHIO, 4000 tons, Standard Oil Co. of Ohio, refinery extensions.

## RAILROAD EQUIPMENT

Railroad equipment buying was almost at a standstill in the past week, but this week probably will bring an inquiry from the Illinois Central for 4500 freight cars. The New York Central is asking for bids on 66 locomotives, and the Erie is inquiring for 50. Details of the week's business follow:

The Illinois Central is expected to issue an inquiry this week for 4500 freight cars of various types, this being about half the number called for in its budget.

The General Electric Co. has ordered 10 steel under-frame flat car bodies from the American Car & Foundry Co.

The Wabash has ordered 2 steel coaches from the American Car & Foundry Co.

The Southern Pacific has ordered 10 locomotives of the 4-10-2 type from the American Locomotive Co.

The American Locomotive Co. has received an order for 10 mountain type locomotives from the Sorocabana Railroad of Brazil.

The Pacific Fruit Express has ordered 89 refrigerator cars from the Pacific Car & Foundry Co. and is asking for prices on 600 underframes.

The Super-Power Co., Chicago, has ordered 4 dump cars from the Clark Car Co.

The Texas & Pacific has placed 30 caboose car underframes with the Virginia Bridge & Iron Co.

The New York Central is asking for prices on 30 4-6-4 type, 30 4-6-2 type and 6 8-wheel switching locomotives.

The Erie Railroad is inquiring for 50 locomotives.

### To Demonstrate Centerless Grinding of Large Bars

The finishing of large bars by the centerless grinding method is being demonstrated at the showrooms of the Motch & Merryweather Machinery Co., 130 West Seventh Street, Pittsburgh. The demonstration will be continued until April 18, or later.

The machine used, the No. 3 centerless grinder of the Cincinnati Grinders, Inc., Cincinnati, will be equipped with a new type of fixture which permits of grinding bars ranging from 1¼ to 4 in. in diameter and 20 in. in length. The principles of this method of grinding and the arrangement of the fixture for handling large bars were described by J. E. Caster in an article on page 927 of THE IRON AGE of March 31.

# NON-FERROUS METAL MARKETS

The Week's Prices	Cents per Pound for Early Delivery		Apr. 5	Apr. 4	Apr. 2	Apr. 1	Mar. 31	Mar. 30
		Lake copper, New York....	13.25	13.25	13.25	13.25	13.25	13.37½
		Electrolytic copper, N. Y.*..	12.87½	12.87½	12.87½	12.87½	12.87½	12.87½
		Straits tin, spot, New York.	69.75	69.87½	...	68.75	68.62½	69.50
		Lead, New York.....	7.25	7.25	7.35	7.35	7.35	7.35
		Lead, St. Louis.....	7.00	7.00	7.05	7.05	7.05	7.10
		Zinc, New York.....	6.90	6.90	6.90	6.90	6.90	6.90
		Zinc, St. Louis.....	6.55	6.55	6.55	6.55	6.55	6.55

\*Refinery quotation; delivered price ¼c. higher.

NEW YORK, April 5.—Only light demand is reported in nearly all the markets. Copper has practically held its own with very little buying. Tin prices have advanced quite sharply, but the turnover has been moderate. Quotations for lead have again been reduced. Firmness as to prices has been the rule in zinc, but demand continues small.

**Copper.**—Consumers and producers are generally marking time and are looking forward with interest to the statistics for March which will appear soon. These frequently have some influence on the market and are generally expected to show an increase in stocks of refined copper, but a substantial decrease in copper at the mines and possibly in blister copper. Buying for export is reported to have been fairly good in the last week, but domestic consumers are showing little interest. Producers are not pressing for sales to any extent, although one or two good sized lots are understood to have been sold during the last few days at a concession under the prevailing price of 13.12½c., delivered in the Connecticut Valley. Most producers are maintaining this quotation and plenty of metal is available at that price. Copper Exporters, Inc., on March 30 reduced its quotation from 13.65c. to 13.50c. c.i.f., Hamburg. It is thought that consumers will have to buy considerable May metal before long. Lake copper is quoted at 13.25c., delivered.

**Copper Averages.**—The average price of Lake copper for the month of March, based on daily quotations in THE IRON AGE, was 13.46c. The average price of elec-

trolytic copper was 13.08c., refinery, or 13.33c., delivered.

**Tin.**—Only about 400 tons of metal changed hands during the week ended Saturday and the market has been generally quiet. The most active day was Wednesday, March 30, when 400 tons changed hands almost entirely among dealers. This spurt of activity was caused by the report of a critical labor situation at the Straits. Later advices from Great Britain, however, showed the trouble to be localized and of small proportions. The report, however, caused a strong, active market on that day, but since then quietness has prevailed. On March 31 about 50 tons, principally English tin, changed hands with 150 tons sold on both April 1 and 2. Yesterday, Monday, the market was a little more active with 250 tons sold, almost entirely to dealers. The market here today was quiet, spot Straits tin being quoted at 69.75c., New York. London prices today were about £3 to £5 per ton higher than a week ago, with spot standard quoted at £310 15s., future standard at £299 15s., and spot Straits at £323 15s. The Singapore price today was £309 10s. Arrivals thus far this month have been 705 tons, with 7335 tons reported afloat.

**Lead.**—The American Smelting & Refining Co. again reduced its quotation yesterday, Monday, from 7.35c. to 7.25c., New York, as its contract price. Quotations in the outside market are correspondingly lower at 7c. to 7.05c., St. Louis. There is still a fair amount of buying, but the market is not as active as recently.

**Zinc.**—Considerable interest centers in what the statistics for March will show, soon to be issued. Reports in the trade indicate that there was a heavy reduction in the number of retorts operating during the month which would lead to the expectation of decidedly reduced stocks. Ore prices were cut another dollar last Saturday to \$43 per ton, and it is stated that

## Metals from New York Warehouse

Delivered Prices per Lb.

Tin, Straits pig.....	71.25c. to 72.25c.
Tin, bar.....	73.25c. to 74.25c.
Copper, Lake.....	14.50c.
Copper, electrolytic.....	14.25c.
Copper, casting.....	13.75c.
Zinc, slab.....	7.50c. to 8.00c.
Lead, American pig.....	8.25c. to 8.75c.
Lead, bar.....	10.80c. to 11.30c.
Antimony, Asiatic.....	15.00c. to 15.50c.
Aluminum No. 1 ingot for remelting (guaranteed over 99 per cent pure).....	29.00c. to 30.00c.
Babbitt metal, commercial grade.....	30.00c. to 40.00c.
Solder, ½ and ½.....	42.50c. to 43.50c.

## Metals from Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig.....	75.00c.
Tin, bar.....	77.00c.
Copper, Lake.....	14.00c.
Copper, electrolytic.....	14.00c.
Copper, casting.....	13.25c.
Zinc, slab.....	8.25c.
Lead, American pig.....	8.25c.
Antimony, Asiatic.....	19.50c.
Lead, bar.....	10.00c.
Babbitt metal, medium grade.....	23.75c.
Babbitt metal, high grade.....	77.00c.
Solder, ½ and ½.....	43.75c.

## Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base per Lb.

<b>Sheets—</b>	
High brass.....	18.37½c. to 19.12½c.
Copper, hot rolled.....	22.00c. to 23.00c.
Copper, cold rolled, 14 oz. and heavier.....	24.25c. to 25.25c.
<b>Seamless Tubes—</b>	
Brass.....	23.25c. to 24.25c.
Copper.....	24.00c. to 25.00c.
Brazed Brass Tubes.....	26.12½c. to 27.12½c.
Brass Rods.....	15.87½c. to 16.87½c.
<b>From New York Warehouse</b>	
Delivered Prices, Base per Lb.	
Zinc sheets (No. 9), casks.....	12.75c. to 13.00c.
Zinc sheets, open.....	13.25c. to 13.50c.

## Non-Ferrous Rolled Products

Lead full sheets were reduced ¼c. on April 4 and are now quoted at 11c. to 11.25c. Mill prices on bronze, brass and copper products have not changed since Feb. 28, and zinc sheets are holding at the reduction of Jan. 10.

### List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

<b>Sheets—</b>	
High brass.....	18.37½c.
Copper, hot rolled.....	22.00c.
Zinc.....	11.00c.
Lead (full sheets).....	11.25c. to 11.50c.
<b>Seamless Tubes—</b>	
High brass.....	23.25c.
Copper.....	24.00c.
<b>Rods—</b>	
High brass.....	16.12½c.
Naval brass.....	18.87½c.
<b>Wire—</b>	
Copper.....	15.37½c.
High brass.....	18.87½c.
Copper in Rolls.....	20.87½c.
Brazed Brass Tubing.....	26.37½c.

### Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of the Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide.....	35.50c.
Tubes, base.....	45.00c.
Machine rods.....	34.00c.



### Rolled Metals, f.o.b. Chicago Warehouse (Prices Cover Trucking to Customers' Doors in City Limits)

Sheets—	Base per Lb.
High brass .....	18.37½c.
Copper, hot rolled .....	22.00c.
Copper, cold rolled, 14 oz. and heavier .....	24.25c.
Zinc .....	12.00c.
Lead, wide .....	10.25c.
Seamless Tubes—	
Brass .....	23.25c.
Copper .....	24.00c.
Braced Brass Tubes .....	26.37½c.
Brass Rods .....	16.12½c.

there is no money in mining at that price. There is no pressure by producers to sell and prices have been firm at 6.55c. to 6.57½c., St. Louis, during the week. We quote prime Western at 6.55c., St. Louis, or 6.90c., New York, for early delivery.

**Antimony.**—Conditions in China have not yet materially affected the market here for Chinese metal, which today is quoted a little lower than last week at 13.50c. for spot and April, and 13c. for futures. It is reported that speculators and dealers have considerable metal here or afloat which tends to render the market easier.

**Nickel.**—Ingot nickel in wholesale lots is quoted unchanged at 35c. with shot nickel at 36c. and electrolytic nickel at 39c. per lb.

**Aluminum.**—Virgin metal, 98 to 99 per cent pure, is quoted at 26c. per lb., delivered.

### Non-Ferrous Metals at Chicago

APRIL 5.—Orders for copper are in fair volume and the price is steady. The demand for lead and zinc is dull and quotations are easier. Old metals are quiet.

We quote in carload lots: Lake copper, 13.50c.; tin, 70.50c.; lead, 7.26c.; zinc, 6.70c.; in less than carload lots, antimony, 15c. On old metals we quote copper wire, crucible shapes and copper clips, 10.25c.; copper bottoms, 9c.; red brass, 9c.; yellow brass, 7.25c.; lead pipe, 6.25c.; zinc, 4.25c.; pewter, No. 1, 35c.; tin foil, 43.50c.; block tin, 52c.; aluminum, 15c.; all being dealers' prices for less than carload lots.

### President Grace Reports Bethlehem's Progress

The Bethlehem Steel Co. is making substantial progress President Eugene G. Grace told its stockholders at the annual meeting in New York, Tuesday, April 5. He predicted that the time is coming soon when the common stock will be put on a dividend basis. When present expenditures of about \$35,000,000 for plant rehabilitation have been completed, which probably will be this year, the physical properties will be in good condition, Mr. Grace said.

"Business is in good volume," Mr. Grace said. "In March the operations were better than 88 per cent. Prices for a time were on the weaker rather than the strong side, but the tendency has been growing to do a bigger volume at a lower percentage of profit. Early indications in the second quarter are that there will be a continuation of good demand for our products." He said operations of Bethlehem plants in the first quarter averaged 79 per cent.

A consolidation between Waterhouse & Lester Co., 540 Howard Street, and the Scovel Iron Store Co., 754 Howard Street, San Francisco, has been completed. The new firm will be known as the Waterhouse-Lester-Scovel Co., 540 Howard Street. The officers of the new company are as follows: S. W. Waterhouse, president and treasurer; George S. Scovel, chairman of the board; G. H. Scovel, vice-president and general manager; A. W. Hanson, secretary; Norman F. Hindson, sales manager.

A complaint has been filed with the Interstate Commerce Commission by the Keystone Steel & Wire Co., charging that the fifth class rates on wire and wire products from its plant at South Bartonville, Ill., to points in Kansas, Oklahoma and Texas are unjust and unreasonable and discriminatory to the advantage of producers in the Birmingham district.

### Old Metals Per Pound, New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators, and the selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible .....	11.25c.	12.50c.
Copper, heavy and wire .....	11.00c.	12.00c.
Copper, light and bottoms .....	9.25c.	11.00c.
Brass, heavy .....	7.00c.	8.50c.
Brass, light .....	6.00c.	7.50c.
Heavy machine composition .....	8.50c.	10.00c.
No. 1 yellow brass turnings .....	7.75c.	8.50c.
No. 1 red brass or composition turnings .....	8.00c.	9.00c.
Lead, heavy .....	6.25c.	6.75c.
Lead, tea .....	4.50c.	5.00c.
Zinc .....	4.00c.	4.50c.
Sheet aluminum .....	15.00c.	17.00c.
Cast aluminum .....	15.00c.	17.00c.

### REINFORCING STEEL

Made up mostly of jobs under 200 tons, the total of concrete reinforcing bar awards in the past week was about 4000 tons. New projects, including a New York warehouse requiring 1000 tons, make a total of very nearly 3000 tons. Awards follow:

NEW YORK, 430 tons, Morgan warehouse, to Fireproof Products Co.  
STRACUSE, N. Y., 100 tons, post office, to McClintic-Marshall Co.  
GARY, IND., 400 tons, bridge for the Chicago, South Shore & South Bend Railway, to American System of Reinforcing.  
EVANSTON, ILL., 175 tons, apartment building, to Concrete Steel Co.  
CHICAGO, 125 tons of rail and new billet steel bars, apartment building at 1528 Morse Avenue, to Concrete Steel Co.  
CHICAGO, 375 tons of rail steel, apartment building at 431 Oakdale Avenue, to Calumet Steel Co.  
ST. PAUL, MINN., 150 tons, storage building, to Joseph T. Ryerson & Son.  
GREEN BAY, WIS., 190 tons, high school, to Concrete Engineering Co.  
GRAND RAPIDS, MICH., 150 tons, storage building, to Concrete Engineering Co.  
MILWAUKEE, 150 tons, shop addition for LeRoi Co., gasoline engines, to Concrete Engineering Co.  
MILWAUKEE, 500 tons of rail steel, United States Government, to Inland Steel Co.  
ST. LOUIS, 200 tons, Bishop Tuttle Memorial building, to Laclede Steel Co.  
FRESNO, CAL., 215 tons, Roosevelt High School, to Kyle & Co., local.  
BERKELEY, CAL., 110 tons, addition to the Alta Bates Hospital, to Superior Steel Placing Co., San Francisco.  
EL CERRITO, CAL., 160 tons, crematory, to Gunn, Carle & Co., San Francisco.  
SAN FRANCISCO, 100 tons, hotel on Geary Street, to Badt-Falk & Co., San Francisco.  
LOS ANGELES, 136 tons, garage, Beverly and Normandy Streets, to an unnamed local jobber.  
LOS ANGELES, 120 tons, parish house, Wilshire Boulevard, to an unnamed company.  
LOS ANGELES, 100 tons, apartment building, Monmouth Street, to an unnamed company.  
LOS ANGELES, 110 tons, apartment building, Ninth and Norton Streets, to an unnamed company.

### Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

NEW YORK, 1000 tons, warehouse for R. C. Williams & Co., Tenth Avenue and Twenty-sixth Street; Barney Aklers Construction Co., general contractor.  
NEW YORK, 400 tons, warehouse and loft building for Model Tenement Building Co., Eleventh Avenue and Forty-eighth Street; Earnest Flagg, architect.  
NEW YORK, 400 tons, widening of Park Avenue between Forty-sixth and Fifty-seventh Streets; James Stewart & Co., Inc., general contractor.  
CHICAGO, 300 tons, apartment building at 2734 Pine Grove Avenue; Thielbar & Fugard, architects.  
CHICAGO, 100 tons, apartment building at 6230 Dorchester Avenue; Olsen & Urbain, architects.  
ROCKFORD, ILL., 325 tons, Talcott Building; Howard Shaw Associates, architects.  
TUCSON, ARIZ., 145 tons, concrete storm sewer; Lee Moore Construction Co., El Paso, Tex., low bidder on general contract.  
OAKLAND, CAL., 125 tons, Fruitvale Medical Building; general contract awarded to Clipper Co., Oakland.  
PORTLAND, ORE., 175 tons, overhead crossing on Capital Highway; bids April 18.

## THE MANGANESE PROBLEM

### Cleveland Meeting Will Consider Economic and Political Aspects

Papers scheduled for the manganese meeting to be held at Cleveland, April 19 and 20, under the auspices of the Iron and Steel Committee and the Ohio Section of the American Institute of Mining and Metallurgical Engineers were listed in our issue of March 31 on page 955. R. C. Allen, of Oglebay, Norton & Co., chairman of the program committee, writes *THE IRON AGE* concerning the bearing of the meeting on the manganese situation in the United States and the importance of its economic and political phases as follows:

"The meeting will be one of unusual interest not only to the members of the institute, but also to those engaged in the iron and steel industry and to the general public. Although there will be interesting papers and discussions on the metallurgy of manganese, important addresses and discussions will be pointed squarely at the position of the United States with respect to supplies of this essential metal.

"Difficulties met and surmounted during the war in keeping our industries supplied with essential minerals, including manganese and a number of others for which we have to depend on imports wholly or partly, as the case may be, have given a great impetus to the study not only of our own resources in these minerals, but to the resources of other countries, including the means by which these minerals may be supplied to our industries in peace and particularly in war. Similar studies are being made in England and in other countries. These studies are being made largely by non-official bodies, such as the American Institute of Mining and Metallurgical Engineers, Mining and Metallurgical Society of America and others, and, of course, appropriate departments of the national Government.

"The average citizen needs to know little of the technical aspects of what we may term the manganese problem, but he ought to know:

1. That manganese is an essential constituent of good steel and a necessary component of certain steels.
2. That the United States has within its borders only small deposits of the ores of manganese, insufficient to meet the normal needs of our industries.
3. That there are no known metallurgical substitutes for manganese in steel making; and finally
4. That the Government of the United States has at this time no policy designed to secure an adequate and continuous supply of this essential mineral.

"In the meeting at Cleveland there will be developed something like an inventory of world resources in manganese, with particular reference to those of our own country. The political aspects of the manganese problem will be developed on a world basis. Finally, it is expected that recommendations for a public policy designed to meet the situation will be developed and discussed.

"An invitation is extended to every one interested in the problem to attend the meeting and take part in the discussions."

Annual report for the twelfth year of Engineering Foundation has been issued from the Engineering Societies Building, 29 West Thirty-ninth Street, New York. It is a pamphlet of 32 pages, with a number of half-tone illustrations, in addition to the financial and operation report. Among the investigations under way are included that of an arch dam, concrete arches, steel columns, fatigue of metals, lubrication, steam properties, strength of gear teeth, bearing metals, welding, wood finishing, and personnel research. Expenditures in 1926 reached \$38,557.

## Homogeneous Lead Coating for Steel

(Concluded from page 996)

ing the reinforcing members and fusing them to the pipe.

### Less Thickness Required When Homogeneous

It is claimed that a homogeneous coating of lead, applied directly to a steel container, does not need to be so thick as the sheet lead lining for wood or steel tanks built for the same purpose. It is stated that a  $\frac{1}{8}$ -in. homogeneous lead coating in a tank will give the same service as a  $\frac{1}{4}$ -in. sheet lead lining. The company recommends that sheet lead lining be retained where it answers the purpose, but that the homogeneously lined equipment be substituted where severe service necessitates a considerable expense for upkeep with sheet lead lining. It is pointed out that, when sheet-lead-lined tanks are used for holding heated acids, the lining will buckle and crack, causing leaks and necessitating relining.

Recently the process was applied in coating aluminum with lead. However, tests have not yet been made to determine to what extent lead-coated aluminum will prove commercially satisfactory. Attempts to lead coat iron castings have not proved successful, as it was found impossible to secure complete adhesion of the lead coating, because of sand pockets, and the castings cracked when heated with a torch.

### Lead-Coated Steel Shipping Drum

The Gross company, in conjunction with the Republic Steel Package Co., Cleveland, has developed a steel drum lined with a homogeneous coating of lead  $\frac{1}{8}$  in. thick. This drum is of 55-gal. capacity; smaller containers can be made when required.

Construction of this drum is designed especially to permit the lead coating of the shell and ends separately. After the head and ends are inserted into the shell, the lead coating is fused to the shell, thereby giving a unit coating over the entire drum, without seams. An inner head and end are designed to receive this lead coating; this, in turn, is bolted to the outer head and end. These outer heads are then double-crimped, after which an  $\frac{1}{8}$ -in. angle iron chime is crimped over the sheet steel crimp. No. 14-gage steel is used throughout.

This drum was subjected to the Interstate Commerce Commission test, which requires a drum to withstand 80-lb. hydrostatic pressure for 5 min. and a 6-ft. drop upon a solid concrete foundation, while filled to within 98 per cent of its capacity. One drum, subjected to both tests, showed only slight distortion in the heads and chime.

This type of drum, having stood the tests required by the shipping container specification 5-A, can now be used for transporting and shipping corrosive and inflammable liquids, which can be shipped in lead containers, according to the requirements of freight and express regulations. The Republic Steel Package Co. plans to make these drums on a production scale. Advantages claimed for this type of container are: no breakage, a low freight classification and a long life.

Lead-coated copper sheets for roofing purposes made by the Gross company are being marketed by J. M. & L. A. Osborne Co., Cleveland. These are given the skin coating by immersion in the lead bath. It is stated that the coating adheres to the copper sheet somewhat better than the coating on a galvanized sheet, and in this respect is comparable with the coating of a terneplate. The copper sheets are given the lead coating largely for appearances. Uncoated copper sheets used for roofing are usually given an application of chemicals to change the copper color into a green or other shade. The lead coating provides a rough gray coating, said to meet with favor among architects.

The Underwriters' Laboratory, which is established and maintained by the National Board of Fire Underwriters, has approved the floor plate made by the Central Iron & Steel Co., Harrisburg, Pa., as safety appliance No. 443.



## PERSONAL

W. S. Hovey, whose election to the presidency of Fairbanks, Morse & Co., Chicago, was announced in THE IRON AGE last week, is the first man to hold that



W. S. HOVEY

position who is not a member of the original Morse family. He is a graduate of Cornell University, and in 1902 became associated with the Sheffield Car Co., a subsidiary of the Fairbanks, Morse company. Later he became superintendent of the former company and in 1913 was made manager of the parent company's engine division at Beloit, Wis. In 1919 he became vice-president in charge of all manufacturing activities and five years later he was made general manager of the entire business, a position he will continue to hold. C. H. Morse, the retiring president, who has been made chairman

of the board, has been associated with the company during his entire business life. Other personnel changes in the company have been announced as follows: R. H. Morse, first vice-president, has been elected vice-chairman of the board; W. E. Miller, vice-president and treasurer, has been made vice-president; F. M. Boughy, secretary and comptroller, has been made secretary and treasurer, and B. R. Wells, assistant secretary, has been promoted to comptroller.

Walter Barrows, 3rd., of the pig iron and coal firm of Barrows & Co., Bankers' Trust Building, Philadelphia, is in Europe for a short trip.

George H. Walsh, for some years associated with the Young Brothers Co., Detroit, has been placed in charge of the office recently opened by that company at Boston. Before coming with the Young company he was employed by the American Foundry & Machine Co.

Charles A. Moore, Jr., for the last three years vice-president of Manning, Maxwell & Moore, Inc., New York, has been elected president of the company to succeed John F. Schurch, who has been made chairman of the board. Mr. Moore is the son of one of the founders of the company and was graduated from Yale University in 1903, and immediately became associated with the company. He did not, however, devote his entire time to the business until 1919. John D. Nicklis, manager of the railroad and mill supply department, has been made a vice-president of the company.

J. S. Bennett, of the engineering department of the American Engineering Co., Philadelphia, has been selected by the Towne Scientific School of the University of Pennsylvania to deliver a series of lectures on stoker firing as part of a new one-year course in fuel engineering to be inaugurated at the university next year.

Ross L. McLellan, formerly managing director of the Cia Westinghouse Electric Internacional Co., has been appointed general manager of the Westinghouse Electric International Co., succeeding D. K. Chadbourne, who has been made vice-president of the Johnson Motor Co., South Bend, Ind.

James F. Curley, general manager of sales Con-

crete Steel Co., 42 Broadway, New York, has been elected a vice-president of the company. He is a graduate of the United States Military Academy, West Point, N. Y., and became associated with the Concrete company in 1914 as manager of its Youngstown plant.

J. H. Coyle, supervisor of engineering Billings & Spencer Co., Hartford, Conn., has been placed in charge of the company's sales engineering work in New York, Pennsylvania and New England, with headquarters at Hartford. He will be engaged principally in the development of special contract forgings and drop forging equipment, but will act in an advisory capacity on other types of work.

Alex L. Feild, until recently on the metallurgical staff of the Central Alloy Steel Corporation, Massillon, Ohio, and engaged for some years previously in similar work for the United Alloy Steel Corporation, has become associated with the Electro Metallurgical Co. and the Union Carbide & Carbon Corporation, with headquarters at 30 East Forty-second Street, New York.

Clarence S. Arms, for the last two years president and general manager of the Wheeldon Wire Co., West Brookfield, Mass., has been appointed to take charge of

the continuous wire drawing machinery department of Sleeper & Hartley, Inc., Worcester, Mass. He is a graduate in mechanical engineering from Union University and later served for 10 years in the furnace and rolling mill departments of the John A. Roebling's Sons Co., Trenton, N. J. Later he became associated with the Wickwire Spencer Steel Corporation and was for eight years in charge of its Palmer Works, Worcester. He left this position to aid the late John Wheeldon in the organization of the Wheeldon Wire Co., having become president and general manager of the concern after Mr. Wheeldon's death.



CLARENCE S. ARMS

L. B. Lindemuth, of Carney & Lindemuth, 40 Wall Street, New York, left for Australia, March 30. He is planning to stay six or eight months in the interest of the Broken Hill Proprietary Co., Ltd., New Castle, New South Wales.

Harvey L. Spaunburg, superintendent of manufacture for the Root Co., Bristol, Conn., has been elected a director. He has been associated with the company since the late war, having had entire charge of the designing and manufacture of automatic counters.

Wadsworth Doster, formerly sales manager Torrington Mfg. Co., Torrington, Conn., has been appointed assistant sales manager of the cold strip machinery department, Mackintosh-Hemphill Co., Pittsburgh. He was manager of the Blake & Johnson Co., Waterbury, Conn., before its merger with the Torrington company.

W. F. Donovan has been made chairman of the board of the Atlas Tack Co., and W. E. Maxson, president. The latter has been vice-president for the past three years.

V. H. Moore, formerly associated with the Pyrotung Co., Chicago, has been appointed chief engineer of the Claud S. Gordon Co., Chicago.

John W. Harris, treasurer Hegeman-Harris Co. Inc., Chicago, has been elected a director for three years, representing the eastern district of the Associated General Contractors of America, Inc. Mr. Harris was one of the delegates appointed by President Coolidge to the International Federation of Building and Public Works at Paris in 1925.

John C. Campbell, president Newark Wire Cloth Co., Newark, on April 2, observed the completion of his fiftieth year as a manufacturer of wire cloth. For the last 16 years he has been at the head of the Newark company, which he organized.

Arthur L. Davis, following the elevation of Joshua A. Hatfield to the presidency of the American Bridge



ARTHUR L. DAVIS

Co., has been made general contracting manager, with headquarters in New York, and he has been succeeded as division contracting manager by Edward B. Stearns. Benjamin P. Talbot has been appointed assistant division contracting manager, succeeding Mr. Stearns. Both Mr. Davis and Mr. Stearns have been with the American Bridge Co. since its formation, the former coming from the Berlin Construction Co. and the latter from the Edgemoor Bridge Co.

Frank W. Trabold has been elected president of the Transue & Williams Steel Forging Corporation, Alliance, Ohio, succeeding Frank E. Dussel, who has been made chairman of the board. Mr. Trabold has been general manager of the company for the past few months and will continue to serve in that capacity. Mr. Dussel is at present in Europe and expects to spend much of the next two years abroad.

Dr. Enrique Touceda, consulting engineer, American Malleable Castings Association, was the guest of the Boston chapter, American Society for Steel Treating, at the Massachusetts Institute of Technology, Cambridge, on April 1. During the afternoon the members of the chapter visited the Mystic Iron Works, Everett, Mass.

George O. Benson, sales manager Niagara Metal Stamping Corporation, Niagara Falls, N. Y., has been elected vice-president in charge of sales.

G. I. Fischer, formerly associated with the California Saw Works, San Francisco, but for the last three years in the Los Angeles office of the Simonds Saw & Steel Co., Fitchburg, Mass., is president of the Pribnow Saw Sharpening Machinery Co., 424 East Third Street, Los Angeles, which was organized recently to manufacture filing room machinery for saw mills. J. F. Pribnow, the inventor of the machines to be manufactured, is vice-president, and R. R. Fox, connected with the Simonds company for more than 30 years, is treasurer. K. H. Jack is secretary of the company and A. J. Stratman, shop superintendent.

A. D. Breeze, vice-president and general manager Cincinnati Ball Crank Co., Cincinnati; George E. Randles, president Foot & Burt Co., Cleveland, and A. E. Henn, manager of machinery sales, National Acme Co., Cleveland, were elected to the board of directors of the National Acme Co. at a recent stockholders' meeting. Other directors and officers of the company were re-elected.

Elmer F. Forbath, recently plant engineer, Southern California Iron & Steel Co., Los Angeles, and sales

engineer Alloy Steel & Metal Co., Los Angeles, has been made general manager of the Air Condition Engineering Co., of the same city. He was educated in Budapest, Hungary, and after coming to this country in 1912 was employed as a designer by the Westinghouse Electric & Mfg. Co., East Pittsburgh. Later he was assistant to the chief engineer in charge of construction at the Farrell works, Carnegie Steel Co., and for some time worked as an estimating engineer on the extension program of the Tata Iron & Steel Co., India, for Perin & Marshall, New York. Before joining the Southern California Iron & Steel Co. he was sales engineer in that territory for the Foos Gas Engine Co. and the Wayne Tank & Pump Co.

Adam Tindel, for many years associated with the former Tindel-Morris Co., Philadelphia, machinery manufacturer, has recently engaged in business again under the firm name of Tindel & Phillips and is manufacturing the Tindel high power rotary cutter. Office and plant are at 516 Commerce Street, Philadelphia.

J. K. Baylis, for many years in the sales department of the Donner Steel Co. in Philadelphia, has been appointed manager of structural and plate sales in the Buffalo district by the Bethlehem Steel Co.

## OBITUARY

JESSE MERRICK SMITH, New York consulting engineer and patent expert, died at his home in that city on April 1, aged 78 years. He was educated at the Rensselaer Polytechnic Institute, Troy, N. Y., and at l'Ecole Centrale des Arts et Manufactures, Paris, France, at the time of his death having been president of the American alumni association of the French school. His early experience was gained in the Hocking Valley of Ohio, where he was engaged in blast furnace and mining engineering. Later he was located in Detroit as a consulting engineer and designer of special machinery and apparatus for manufacturing plants and power stations. In 1898 he established an office in New York, which was maintained until his partial retirement in 1914. He was a charter member of the American Institute of Electrical Engineers and in 1909 was president of the American Society of Mechanical Engineers.

CHARLES W. HOLTZER, chairman Holtzer-Cabot Electric Co., Cambridge, Mass., died at his home in Brookline, Mass., March 31. He was born in Karlsruhe, Germany, in 1848, and came to America in 1866. For two years he was interested in artillery ammunition experiments, and in 1875 engaged in the manufacture of clocks. Next he was identified with the manufacture of electrical apparatus and machinery, and in 1889 incorporated under the name of The Holtzer-Cabot Electrical Co.

FRANK J. FORD, president Ford Chain Block Co., Second and Diamond Streets, Philadelphia, died March 29 at his home in that city. He was 66 years of age.

HERBERT D. TWITCHELL, secretary-treasurer and general manager of the H. P. Deuscher Co., Hamilton, Ohio, manufacturer of gray iron castings, died on March 30.

HENRY TOPPING, father of John A. Topping, chairman of the Republic Iron & Steel Co., died April 1 at his home in Kansas City, Mo., at the age of 92 years.

Waldo, Egbert & Maltby, Inc., Buffalo, dealer in pig iron, coke, alloys, steel, etc., will move from the Marine Trust Building to the Liberty Bank Building, effective April 15.



## Canada Now Has an Iron and Steel Institute

The Iron and Steel Institute of Canada was organized at a meeting held at the University Club of Montreal, Canada, on March 2. The resolution defining the purpose of the institute was presented by Grant Hall, vice-president of the Canadian Pacific Railway, Montreal, and J. G. Morrow, Steel Company of Canada, Hamilton. Commenting on the purpose of the institute, *Iron and Steel of Canada* says editorially:

There are many ways in which this organization will be of service to the industry and one of the first will be as a medium through which those in the industry may become better acquainted with one another. Common interest forms a strong bond of union and is the finest foundation upon which to develop a spirit of cooperation. The immediate purpose of the institute is to provide self-study courses of instruction for those in the industry, particularly the young apprentices, similar to the courses provided by the Canadian Pulp and Paper Association for the workers in that industry.

The executive committee, which is to consist of the officers and directors, was named as follows for the first year:

*President:* Grant Hall, Montreal, vice-president Canadian Pacific Railway, Montreal.

*First vice-president:* F. W. Gray, British Empire Steel Corporation, Montreal.

*Second vice-president:* J. G. Morrow, Steel Co. of Canada, Hamilton.

*Secretary:* J. J. Harpell, president Institute of Industrial Arts, Gardenvale.

*Assistant secretary:* R. E. R. Parry, managing editor, *Iron and Steel of Canada*, Montreal.

*Directors:* J. D. Gray, Algoma Steel Corporation, Montreal; Dr. A. Stansfield, professor of metallurgy McGill University, Montreal; Chester B. Hamilton, Hamilton Gear & Machine Co., Toronto; Prof. R. C. Young, professor of mechanical engineering, Toronto University, Toronto.

The resolution adopted at the organization meeting recites that iron and steel manufacture, next to agriculture, gives employment to the largest number of people in Canada; that steps should be taken to create courses of study and encourage young workers in the industry to make use of them; also that "there are many other matters of common interest that might be promoted if the iron and steel manufacturing and fabricating industry were organized, and thereby had an opportunity of coming together occasionally in convention."

## Concrete Reinforcing Steel Institute Elects Officers

George E. Routh, Jr., vice-president Kalman Steel Co., Chicago, was elected president of the Concrete Reinforcing Steel Institute at its third annual meeting held recently at White Sulphur Springs, W. Va. Louis C. Meyers, president Concrete Engineering Co., Omaha, Neb., was made vice-president and Hugh J. Baker, president Hugh J. Baker & Co., Indianapolis, was named treasurer. W. H. Pouch, president Concrete Steel Co., New York, and D. B. Knowlton, general manager Dudley Bar Co., Birmingham, were elected directors, succeeding Louis Aronstam, Atlanta, and P. J. Igou, Newark, N. J. M. A. Beeman was reelected secretary and the appointment of R. W. Johnson as engineer was confirmed.

## Welding Society to Hold Three-Day Meeting

Research activities in the field of welding will be given prominent place on the program of the eighth annual meeting of the American Welding Society, which will be held at the Engineering Societies Building, New York, April 27, 28 and 29.

There will be meetings of the gas welding, electric arc, joint boiler code and other committees, and a session under the auspices of the American Welding Bureau, which is the research division of the welding society, is planned for the afternoon of April 27.

A symposium on production welding, to be held on the afternoon of April 28, will be a feature. A dinner dance has been arranged and special entertainment will be provided for the ladies.

## Amalgamated Association Considering 1927 Wage Scales

ST. LOUIS, April 5.—The annual convention of the Amalgamated Association of Iron, Steel and Tin Workers of North America, opened this morning at Labor Temple, Granite City, with President Michael F. Tighe in the chair. The principal work of the convention will be to pass upon the report of the committees having in charge the formulation of the wage scales, covering the puddling and finishing of bar iron and the sheet and tin mill and tin house wages, to be presented at a conference to be held next month between representatives of companies signing a wage scale agreement with the association and the wage scale committee of the association.

## Standards in Metal Spools and Reels to Save Large Sum

WASHINGTON, April 4.—Unanimous recommendation that the 2-lb., 5-lb., 10-lb., 25-lb., 50-lb. and 100-lb. be retained as the standard list of metal spools, effective Jan. 1, 1928 for new production, was made here last Thursday at a conference on simplification for stock sizes and dimensions of metal spools. The sizes to be eliminated are the 1-lb. and 3-lb. types. The conference was held under the auspices of the National Committee on Metals Utilization, Department of Commerce.

The initial definite step was confined to the matter of unit weight of wire for each spool and the least number of metal spools necessary in connection with the annealing, handling and shipping of wire. A standing committee was named to give consideration to uniformity of traverse and diameter of flange. It was disclosed that there is a tendency toward larger drums and it was the opinion that the matter of standard barrel and arbor sizes should be left to the standing committee for further study and recommendations, to be taken up at a subsequent conference.

In considering the item of annealing reels it was suggested that the traverse be lengthened to take care of the 500-lb. reel. This item will be considered by the standing committee, as well as the matter of sizes and diameters for both metal and wood take-off reels. One manufacturer, having \$3,000,000 invested in spools and reels, according to a statement issued by the department, predicted a saving of one-half this amount if a standard list of sizes could be adopted and given adherence.

## About 150,000 Tons of Swedish and African Ore Bought

The Bethlehem Steel Corporation has recently closed on a sizable tonnage of Swedish and North African iron ore for delivery during the current year to Sparrows Point, Md., or Philadelphia, as specified by the purchaser at time of delivery. The minimum tonnage provided in the contract is understood to be about 150,000 tons, with the maximum to be decided upon later. With the exception of two cargoes, about 10,000 tons, of North African ore, the contract will be filled from Sweden.

The foreign ore market has been quite active in the past few months and prices are firmer than during the greater part of 1926. Last year the British coal strike curtailed the demand for European and African ore and an added factor was the negotiations in Germany for the formation of the Vereinigte Stahlwerke A. G. While these negotiations were in progress, the companies considering the merger permitted their ore stocks to be depleted to a low point. Later in the year, the new corporation came into the market to contract for ore and purchasing began to revive among British consumers.

# Machinery Markets and News of the Works

## BUSINESS IS SPOTTY

### Machine Tool Orders for March Showed No Marked Gain

#### Absence of Large Buying by Automobile Manufacturers and Railroads a Factor in the Situation

LACK of large buying by automobile manufacturers and the railroads, two of the principal outlets for machine tools, has had a marked effect on the machine tool situation for the first quarter of the year. A leading machine tool manufacturer estimates that its sales in the Detroit territory during the first three months of the year were 40 per cent below those of the corre-

sponding period last year, and, with some variations, this probably has been the experience of the machine tool trade as a whole. A good deal of railroad buying is pending in the form of large inquiries which have been issued since the first of the year, but only a small part of such business has been consummated.

From the Cincinnati district it is reported that machine tool sales have fallen off sharply in the past 10 days. Railroad purchases are almost at a standstill and orders from automobile manufacturers are light. Opinion is divided as to the outlook for the next two months. Inquiries have been fairly numerous, but users of tools continue to show great hesitation in placing orders.

One of the largest orders of the week was for eight deep-hole drilling machines bought by a Racine, Wis., automobile plant.

## New York

NEW YORK, April 5.

MARCH was a disappointing month in machine tool sales, but the number of orders in prospect encourages some in the trade to believe that April business will show an improvement. One of the most interesting developments of the week was an increase in orders from automobile companies. An Eastern machine tool company received an order for eight deep-hole drilling machines from a Racine, Wis., automobile plant; a Flint, Mich., plant bought a bench lathe and a bench milling machine; a Toledo, Ohio, automobile company bought a die sinker; a Pontiac, Mich., plant bought a profiling machine and a centering machine, and a Detroit company bought a jig borer. Among other orders was one for an automatic lathe by a Detroit twist drill manufacturer; an agricultural machinery company in Chicago bought a centering machine. The Southern Pacific and the Chicago, Indianapolis & Louisville each bought a 16-in. lathe.

The American Can Co., 120 Broadway, New York, has acquired about five acres at Pacific Grove, Monterey County, Cal., as a site for a new plant, reported to cost in excess of \$600,000 with machinery. The engineering department, New York, will be in charge. Pacific Coast headquarters are in the Mills Building, San Francisco.

The Meurer Steel Barrel Co., 23 West Forty-third Street, New York, is having revised plans drawn for two one-story additions to its plant at Long Island City, to cost more than \$25,000 with equipment. L. Allmendinger, 852 Monroe Street, Brooklyn, is architect.

The American Hard Rubber Co., 11 Mercer Street, New York, has plans for a new power house at its factory at College Point, L. I., to cost in excess of \$100,000 with equipment. Walter Kidde & Co., 140 Cedar Street, are engineers.

The Cruz Collapsible Rim Corporation, José Cruz, room 1311, 1560 Broadway, New York, president, recently organized, is contemplating the construction of a new plant for a recently patented collapsible rim for automobile wheels, invented by Mr. Cruz.

August Viemeister, 25 West Forty-third Street, New York, architect, has plans for a one-story automobile service, repair and garage building on West 219th Street, to cost about \$100,000 with equipment.

The Equitable Laundry Machinery Corporation, 145 West Forty-fifth Street, New York, has leased the factory at 852-58 Vernon Avenue, Long Island City, with option to purchase, for the establishment of a new and larger plant.

The White Motor Co., Long Island City, with plant at

Cleveland, has plans nearing completion for a new factory branch, service and repair building in this section, aggregating 80,000 sq. ft. of floor space, reported to cost \$175,000 with equipment. Hughes & Conrad, Union Mortgage Building, Cleveland, are architects.

The Segal Lock & Hardware Co., 155 Leonard Street, New York, has awarded a general contract to Vernard Robinson, 101 West Forty-first Street, for extensions and improvements in a one-story building on Ferris Street, Brooklyn, to be occupied as a foundry. Lockwood, Greene & Co., 100 East Forty-second Street, New York, are architects and engineers.

The Bush Terminal Co., 100 Broad Street, New York, has plans for a new power house at its terminal warehouses, foot of Forty-third Street, Brooklyn, to cost more than \$500,000 with equipment. Stevens & Wood, Inc., 120 Broadway, New York, is engineer.

The Enamel Sterling Co., New York, has leased space in the building at 47-49 Malden Lane, for a new plant, and will occupy at once.

The International Paper Co., 1 Pershing Square, New York, has awarded a general contract to the Domini Construction Co., 100 East Forty-second Street, for extensions and improvements in its mill at Fort Edward, N. Y., including remodeling of present buildings, to cost more than \$1,000,000 with machinery.

The Westchester Electric Railway Co., 2396 Third Avenue, New York, is having plans drawn for a new car barn with shop facilities at Mount Vernon, N. Y., estimated to cost \$215,000. Bids will soon be asked on a general contract. J. Bourguignon, 18 West Thirty-fourth Street, is consulting engineer.

Frederick J. Fox, 2382 Grand Concourse, New York, architect, has filed plans for a new one-story automobile service, repair and garage building, 80 x 200 ft., at 204 West 101st Street, to cost \$200,000 with equipment.

The Board of Education, Congers, N. Y., is said to be planning the installation of manual training equipment in its proposed two-story high school, to cost \$115,000, for which plans are being drawn by J. M. Stevens, 122 East Forty-first Street, New York, architect.

The Vacuum Oil Co., 61 Broadway, New York, has awarded a general contract to the Turner Construction Co., 244 Madison Avenue, for a one-story addition to its oil refinery at Constable Hook, Bayonne, N. J., to be 75 x 150 ft., estimated to cost \$75,000.

John B. Astell & Co., foot of Morgan Street, Jersey City, N. J., manufacturers of boiler tubes, etc., have leased a one-story building, 80 x 86 ft., at 101 Pacific Avenue for expansion.

The Berger Mfg. Co., Canton, Ohio, manufacturer of metal filing cabinets, metal ceilings, etc., has leased property at 53-60 Earl Street, Newark, N. J., for a new factory branch and distributing plant.



Fred W. and James H. Smith, Jr., formerly connected with the Smith Rubber & Tire Co., Garfield, have acquired the mill on Wallington Street, East Rutherford, N. J., and will remodel for a new plant.

The Lidgerwood Mfg. Co., 326 Frelinghuysen Avenue, Newark, manufacturer of hoisting engines and machinery, has awarded a general contract to James Mitchell, Inc., 40 Journal Square, Jersey City, N. J., for its new plant on a 20-acre tract recently acquired at Bayway, Elizabeth, N. J. The initial unit will consist of a machine shop and assembling works, reported to cost more than \$350,000, designed to replace the branch plant at the foot of Dikeman Street, Brooklyn, which will be removed to the new location.

The Mountain Ice Co., 145 Murray Street, Newark, has filed plans for a new plant, to cost about \$45,000 with equipment.

The Pittsburgh Testing Laboratory, Pittsburgh, inspecting engineer and chemist, has removed its New York office and laboratory to 72 Washington Street.

The New York Telephone Co., 140 West Street, New York, advises that the item published a few weeks ago to the effect that it was planning the erection of a power plant in connection with a new station at White Plains is incorrect and that it has no intention of building such a plant.

The Turner Construction Co., New York, has removed its main office to the Graybar Building, 420 Lexington Avenue.

The Fairbanks Co., New York, effective April 1, assigned to Fairbanks, Morse & Co., Chicago, the contract under which it has acted as distributor of Fairbanks scales in certain territories, and will discontinue the scale branch of its business. The company will carry on the manufacture of valves at Binghamton, N. Y., and trucks and wheelbarrows at Rome, Ga., and these products together with its Dart unions, will be marketed through dealers as heretofore.

The Newark Fire Protection Equipment Co., Academy Building, Newark, has been organized as jobber of fire protection equipment and safety devices for industrial organizations, municipalities and miscellaneous projects.

The W. N. Best Corporation, New York, has removed its general headquarters from 11 Broadway to the Greeley Square Building, Sixth Avenue and Thirty-first Street.

## Philadelphia

PHILADELPHIA, April 4.

**P**LANs have been filed by the Philadelphia Gear Works, Richmond and Tioga Streets, Philadelphia, for a new one-story plant, 135 x 400 ft., to cost about \$150,000 with equipment.

Max A. Bernhardt, 127 South Eighteenth Street, Philadelphia, architect, has plans under way for a new multi-story automobile service, repair and garage building, to cost in excess of \$400,000 with equipment.

Harper & Harper, 720 North Broad Street, Philadelphia, automobile dealers, have leased a new five-story building to be erected at 1513-15 North Broad Street, totalling about 60,000 sq. ft., for a new service, repair and garage building, to cost \$175,000 with equipment.

Quinn Brothers, 1615 North Second Street, Philadelphia, metal contractors, are having plans drawn for a new two-story plant, 52 x 95 ft., to cost about \$40,000. It is understood that the present works will be removed to the new location and additional equipment installed. The Penwood Co., City Center Building, is architect.

The Precision Grinding Wheel Co., Inc., 8301 Torresdale Avenue, Philadelphia, has filed plans for a one-story addition to cost about \$10,000.

The Jordan Philadelphia Co., Philadelphia, recently formed to act as local representative for the Jordan automobile, has taken over the building at 901-3 North Broad Street, for a new service, repair and sales building. A parts department will be provided.

Officials of the John Wood Mfg. Co., Conshohocken, Pa., manufacturer of boilers, tanks and other plate products, have formed the Metalware Corporation, to provide for the consolidation of the Wood company with three other companies in similar line of manufacture. Plants will be located at Conshohocken, New York, Rochester, N. Y., and St. Paul, Minn. Frank Sutcliffe, president of the John Wood Mfg. Co., will be president and general manager of the new organization.

LeRoy B. Rothschild, 215 South Broad Street, Philadelphia, architect, has asked bids on a general contract for an eight-story automobile service, repair and garage building, 60 x 80 ft., to cost about \$225,000 with equipment.

The Haverford Township School Board, Herbert H. Fairbanks, secretary, care of the Toland-Trimble Co., 1326 Walnut Street, Philadelphia, is considering the installation of manual training equipment in the two-story additions to its junior and senior high schools at Brookline, Pa., to cost

\$200,000. Boyd, Abel & Gugert, Otis Building, Philadelphia, are architects.

Remington-Rand, Inc., 374 Broadway, New York, recently formed by a merger of the Remington Typewriter Co., and the Rand-Kardex Bureau, North Tonawanda, N. Y., has acquired the Powers Accounting Machine Corporation, Wilkes-Barre, Pa., manufacturer of assorting and calculating machines and parts, with branch plant at New Brunswick, N. J., and will consolidate with its organization. The purchase includes the Accounting & Tabulating Machine Corporation, a subsidiary of the Powers company. It is understood that the present Wilkes-Barre plant will be maintained.

The School Board, Administration Building, 31 South Penn Street, Allentown, Pa., T. P. Wenner, secretary, is asking bids until April 18, for 24 motors complete with starters for use in public schools; also for pipe frames, pipe frame tables, etc.

The R. H. Beaumont Co., 319 Arch Street, Philadelphia, has taken over the business of the American Mfg. & Engineering Co., Kalamazoo, Mich., and will continue the manufacture of its products, including the American slack line cableway excavator. S. O. Nafziger, president of the American company, will be associated with the Beaumont organization.

The Ambler Asbestos Co. of Cuba, Havana, has been organized as a subsidiary of the Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa., to handle the sale in Cuba of the parent company's products.

## Chicago

CHICAGO, April 4.

**T**HE machine tool market is spotty. The general opinion is, however, that both purchases and inquiries are more numerous. A railroad that operates north-west of Chicago is said to have a large list in course of preparation and the Ruck Island is asking for prices on a 36-in. shaper, a 6-ft. radial drill, a car-wheel boring machine and a micro-grinder. The Studebaker Corporation, South Bend, Ind., is preparing to equip an experimental department and is asking for prices on 16 lathes of various sizes and two crank shapers. The Winslow & Boller Engineering Co., Galesburg, Ill., is inquiring for a milling machine, a grinder, a radial drill and several lathes. The Bendix Brake Corporation, South Bend, Ind., bought a number of tools, among which were a tool-room miller and a low swing lathe. The Hershey Mfg. Co., Chicago, has purchased two milling machines and several drills and the Sibley Machine Co., South Bend, Ind., has placed a 24-in. automatic miller.

The Strom Steel Ball Co., whose plant at Oak Park, Ill., was recently damaged by fire, has purchased a site for a new plant in Cicero, Ill.

The Red Oak Machine Co., Red Oak, Iowa, is building an addition to its machine shop.

The Cannon Oiler Co., whose factory in Keithsburg, Ill., was recently burned has decided to rebuild instead of moving to some other city, as was contemplated.

The Mudge Co., 4425 West Ninety-sixth Street, Chicago, manufacturer of railroad specialties, will build an addition, 86 x 105 ft., to cost \$26,000. A. R. Ingall, 7127 Princeton Avenue, is architect.

The Lincoln Casket Co., Lincoln, Ill., is considering the erection of a two-story addition, to cost about \$27,000 with equipment.

The Beardsley & Piper Co., 2621 North Keeler Avenue, Chicago, manufacturer of foundry equipment, has awarded contract to the Austin Co., for a one-story addition, to cost about \$45,000 with equipment.

The Rockford Fibre Container Co., Catherine Street, Rockford, Ill., will soon begin the construction of an addition to cost approximately \$100,000, of which more than \$65,000 will be expended for new equipment.

The City Council, Marshall, Minn., is planning to ask bids early in May for a new municipal electric light and power plant, to cost \$150,000 with equipment. The Pillsbury Engineering Co., 2344 Nicollet Avenue, Minneapolis, Minn., is engineer.

The Aurora Milling Co., Springfield, Ill., is considering rebuilding the portion of its grain milling plant destroyed by fire March 23, with loss reported at \$160,000 including machinery.

The Kiowa Foundry Co., Marshalltown, Iowa, has plans under way for a new one-story foundry, to cost about \$27,000 with equipment. H. E. Reimer, Kibbey Building, is architect.

## The Crane Market

**I**NQUIRIES for overhead and locomotive cranes continue to accumulate, but purchasing is still small. The General Engineering & Management Corporation, Reading, Pa., has not yet closed on a 30-ton electric traveling crane. The Green Fuel Economizer Co., Beacon, N. Y., is reported to be in the market for three, small capacity electric traveling cranes. The Warren Foundry & Pipe Co., Phillipsburg, N. J., is inquiring for a used 5-ton, 57-ft. span, 3-motor overhead crane.

Among recent purchases are:

New York, New Haven & Hartford Railroad, New Haven, Conn., two 25-ton locomotive cranes, reported purchased from the Industrial Works and a 10-ton, 65-ft. span, 4-motor gantry crane from an unnamed builder.

Lockwood, Greene & Co., 1 Pershing Square, New York, two small capacity overhead cranes for the Wesson Oil Co., from an unnamed builder.

Providence Steel & Iron Co., Providence, R. I., a 4-ton Sprague electric hoist from a local supply dealer.

Stone & Webster, Inc., Boston, three crest gate lifting beams for Conowingo, Md., from an unnamed builder.

National Tube Co., Pittsburgh, a 10-ton, 39-ft. span magnet handling crane for the Christy Park works, from the Alliance Machine Co.

Colorado Fuel & Iron Co., Pueblo, Colo., three 175-ton, 54-ft., ladle cranes and three 7½-ton, low type, open-hearth charging machines from the Morgan Engineering Co.

Interstate Iron & Steel Co., Chicago, a 10-ton, 100-ft. span overhead crane from the Morgan Engineering Co.

Weirton Steel Co., a 25-ton, 76-ft. span, special bucket handling crane and a 10-ton trolley from the Morgan Engineering Co.

Vincennes Bridge Co., Vincennes, Ind., a 10-ton electric traveling crane from the Milwaukee Electric Crane & Mfg. Co.

Amardo Petroleum Corporation, Tulsa, Okla., a crawl-tread locomotive crane with magnet from the Bergan Schmidt Co.

The City Council, Massena, Iowa, plans the installation of pumping equipment, with elevated steel tank and tower, in connection with proposed extensions and improvements in the municipal waterworks to cost about \$30,000. W. E. Buell & Co., Davidson Building, Sioux City, Iowa, are engineers.

The Willey-Ellis Co., 1223 South Talman Avenue, Chicago, manufacturer of laundry machinery and parts, has plans under way for a one-story addition, 222 x 246 ft., to cost close to \$200,000 with equipment. The company recently acquired the Ellis Dryer & Elevator Co., and will give over a portion of the new unit, it is understood, to this branch of the business. H. C. Ellis is head.

The Tennessee-Illinois Phosphate Co., 137 South La Salle Street, Chicago, has inquiries out for a rock crusher with capacity of about 3 tons per hr., portable hammer, mill type.

The Hughes Electric Co., Bismarck, N. D., has completed plans for extensions and improvements in its steam-operated electric power plant at Buhlah, N. D., to cost about \$60,000 including equipment.

The Baker Steam Motor Car & Mfg. Co., Pueblo, Colo., is said to be completing plans for a one-story addition, to cost in excess of \$40,000 with equipment.

The Waage Electric Co., 5100 Ravenswood Avenue, Chicago, has awarded a general contract to the Chicago Industrial Construction Co., 53 West Jackson Boulevard, for a one-story top addition to its factory, 50 x 150 ft., to cost about \$20,000. Additional equipment will be installed.

M. O. Nathan, 123 West Madison Street, Chicago, architect, will soon ask bids for a three-story automobile service, repair and garage building, to cost \$275,000 with equipment.

The North Shore Coke & Chemical Co., Chicago, a subsidiary of the North Shore Gas Co., Waukegan, Ill., recently organized, has plans under way for new artificial gas, coke and by-products plant at Waukegan, where a tract of 40 acres has been secured. The plant will cost in excess of \$2,500,000 with machinery. The company is disposing of a bond issue of \$2,000,000, the fund to be used in connection with construction. The William A. Baehr Organization, 232 South Clark Street, will manage the property, and is the consulting engineer. William A. Baehr is president of the North Shore company.

The Donahue Steel Products Co., Inc., Chicago, is removing its offices from 1147 South Washtenaw Avenue to Seventy-fourth and Ashland Avenues.

new school to be erected at Plymouth and Rhode Island Avenues, estimated to cost \$500,000. Plans have been filed.

The Seebold Invisible Camera Co., Rochester, N. Y., has been organized to take over the local plant and business of the Gundlach-Manhattan Optical Co., consisting of a four-story structure, totaling about 37,200 sq. ft. of floor space. The new company will consolidate the Gundlach-Manhattan company with its organization and will use the factory for the manufacture of a patented camera designed in bullet-proof case for the prevention and detection of crime. It will also take over the Invisible Eye Co. of Illinois, Chicago, manufacturer of kindred equipment. A stock issue of \$600,000 has been arranged, a portion of the fund to be used for the acquisition of the property noted and for expansion. John E. Seebold is president.

The Board of Education, District No. 1, Arcade, N. Y., is considering the installation of manual training equipment in a two-story high school, estimated to cost \$165,000, for which plans have been drawn by A. F. Gilbert, 358 Fifth Avenue, New York.

The Board of Education, Genesee Building, Buffalo, plans the installation of manual training equipment in additions to be erected at school No. 52, on Barry Place, estimated to cost \$315,000, and to school No. 53, at Winslow and Roehrer Streets, to cost \$358,000. The Bureau of School Architects, 1411 Genesee Building, Ernest Crimi, supervising architect, will be in charge.

The Salmon River Table Co., Pulaski, N. Y., is considering plans for the rebuilding of the portion of its factory recently destroyed by fire, with loss approximating \$100,000 including machinery.

The main office of the Kaustine Co., Inc., sanitary engineer, has been moved from Buffalo to its plant at Perry, N. Y.

The Leach Steel Co., Buffalo, structural steel fabricator, has purchased a plot of ground at Rochester, N. Y., and will begin construction of a new plant in that city on April 15. The main building will be 80 x 400 ft. and will later be enlarged by a 400-ft. extension. The company's fabricating facilities will be removed from Buffalo, but a sales office will be maintained in that city. Thomas Leach, president of the company, gained his experience in the structural field with the American Bridge Co., the Dominion Bridge Co. and the Westinghouse, Church, Kerr Co.

## St. Louis

ST. LOUIS, April 4.

**P**LANs have been filed by the Hinderliter Tool Co., North Madison Street, Tulsa, Okla., manufacturer of oil well tools and machinery, for its new plant, including machine and forge shops, to cost about \$100,000 with equipment.

The St. Louis-San Francisco Railway, Frisco Building, St. Louis, has plans under way for the construction of new car and locomotive shops at Tulsa, Okla., including the removal of the present terminal shops at Sapulpa, Okla., to that location. G. F. Jonah is chief engineer.

The Missouri-Kansas-Texas Railroad Co., Railway Exchange Building, St. Louis, has plans for a new oil storage and distributing plant at Parsons, Kan., to cost approximately \$45,000 with equipment. A. L. Sparks is company architect.

The Common Council, Canton, Okla., is planning for extensions and improvements in the municipal electric light and

## Buffalo

BUFFALO, April 4.

**P**LANs are being completed for a reorganization of the Wire Wheel Corporation of America, Inc., 1700 Elmwood Avenue, Buffalo, manufacturer of automobile wheels, to provide for expansion. Negotiations are said to be in progress for the purchase of another company in the same line of production and the consolidation of production at the Buffalo works, which will be expanded.

J. P. Danielson & Co., Inc., 583 Allen Street, Jamestown, N. Y., manufacturer of wrenches and other tools, has plans for a one-story addition, to cost more than \$40,000 with equipment. Oliver R. Johnson, Fenton Building, is architect.

The Board of Education, Buffalo, is said to be planning the installation of manual training equipment in its proposed



power house, including the installation of additional equipment. A bond issue is being arranged.

The Acme Spring Bed & Mattress Co., 1401 North First Street, Fort Smith, Ark., has plans under way for a one-story addition, 75 x 200 ft., to cost about \$25,000 with equipment. Wheeler & Bassham, Kennedy Building, are architects.

The City Council, Grand Island, Neb., will ask bids in about a week for an addition to the municipal electric light and power plant, including the installation of superheaters and other power equipment. The Pillsbury Engineering Co., 2344 Nicollet Avenue, Minneapolis, Minn., is engineer. H. E. Clifford is city clerk.

The A. B. C. Auto Sales Co., 3519 Page Boulevard, St. Louis, has awarded a general contract to the Harrison-Kopman Construction Co., Arcade Building, for a four-story and basement service, repair and garage building, 75 x 90 ft., to cost close to \$100,000 with equipment.

The Oklahoma Engine & Compressor Co., Bartlesville, Okla., operated by the Nash-Diesel Engine Co., Marietta, Ohio, has leased the former plant of the Mid-Co. Machine Works for the establishment of a new plant for rebuilding and repairing Diesel engine units.

The City Council, Ponca City, Okla., will soon take bids for its proposed municipal electric light and power plant, including two Diesel engine units, generator and auxiliary equipment, to cost about \$175,000. The Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is engineer.

The Lee Hardware Co., Salina, Kan., has plans for a new three-story storage and distributing plant, 64 x 100 ft., with wing extension, 20 x 30 ft., to cost more than \$65,000 with equipment. Charles W. Shaver, 147 South Santa Fe Street, is architect.

N. B. Howard and M. C. Finley, International Life Building, St. Louis, architects, have filed plans for a one and two-story automobile service, repair and garage building, to cost about \$100,000 with equipment.

The City Council, Blair, Neb., is planning to ask bids early in May for extensions and improvements in the municipal electric light and power plant, including the installation of additional equipment. A fund of \$35,000 is available. The Pillsbury Engineering Co., 2344 Nicollet Avenue, Minneapolis, Minn., is engineer.

The American Eagle Aircraft Co., 2330 Harrison Street, Kansas City, Mo., has incorporated with an authorized capital stock of \$100,000 to carry on the manufacture of airplanes and parts.

The Handlan-Buck Co., St. Louis, has been appointed distributor in that territory for the Triumph Electric Corporation, Cincinnati.

## Cleveland

CLEVELAND, April 4.

THE machine tool market showed improvement in the volume of inquiry the past week, although dealers' sales were light. Demand is widely scattered and limited to single tools. A local manufacturer of turret lathes reports an improvement in orders, and with better business at the end of the month its March sales were larger than those in February. Business is still light in the Michigan territory, orders from automobile companies being mainly for replacement. One machine tool manufacturer reports that its sales in the Detroit territory the first three months of this year ran 40 per cent behind the same period last year. This probably indicates the average reduction in buying by the automotive industry this year.

The Oakland Motor Car Co. has purchased a small amount of additional equipment, but reports that that company was a large buyer the past week appear unfounded. The Oakland company placed its new Pontiac plant in Flint in operation a few days ago, and if it decides to go ahead with its contemplated foundry will require considerable equipment for that plant.

Used machinery is in fair demand. Woodworking machinery has become quite active in the northern Ohio district.

The Pressed Metal Products Co., 6915 Colfax Road, Cleveland, has taken over the business of the American Specialties Co. of that address and of the Champion Radiator Co. The new company will make metal toys, rumble seats for automobiles and other products. W. P. Champney is manager.

The Torchparts Air Appliance Co., 2100 West Superior Avenue, Cleveland, has absorbed the Torch Parts Co., 2440 West Superior Avenue, and will manufacture stove burners

and welding valve regulators. J. R. Rose is president and A. E. Slinger, vice-president and general manager.

The Marquette Metal Products Co., 16,606 Waterloo Road, Cleveland, has awarded a contract to the William Dunbar Co. for a factory and office building, 100 x 200 ft.

The Fremont Foundry Co., Fremont, Ohio, contemplates the erection of a one-story, 54 x 74 ft. core room. Knox & Elliott, Engineers Building, Cleveland, are the architects.

The Industrial Metal Products Co., Ravenna, Ohio, has been organized to manufacture a line of electrically welded sheet metal products.

The Modell-Friedman Steel Corporation, Cleveland, has been organized as a subsidiary of Friedman Brothers & Co., Inc., East 103rd Street and Harvard Avenue, Cleveland, to maintain a warehouse for the sale of sheet and strip steel.

The Lawson Mfg. Co., Cleveland, has removed to larger quarters at 2720-24 East Fifty-third Street.

The Northern Ohio Power & Light Co., Akron, Ohio, is arranging an expansion and improvement program during 1927 to cost in excess of \$1,600,000, including additions to power capacity and extensions in transmission lines. More than \$500,000 will be expended for enlargement of the power substation at South Akron.

The Marquette Metal Products Co., Waterloo Road, Cleveland, has awarded a general contract to the William Dunbar Co., 3201 Cedar Avenue, for a one-story machine shop, to cost close to \$75,000 with equipment. James S. Kustin is secretary and treasurer. Another unit will be built later.

The Board of Education, Parma, Ohio, is planning the installation of manual training equipment in its proposed junior high school, estimated to cost \$400,000, for which bids are being asked on a general contract. Fulton & Taylor, 8120 Euclid Avenue, Cleveland, are architects.

The Sinclair Oil Co., Toledo, Ohio, plans to rebuild the portion of its oil storage and distributing plant at 1435 Miami Street recently destroyed by fire, with loss reported at \$140,000 including equipment.

The Canfield Oil Co., 3216 East Fifty-fifth Street, Cleveland, has filed plans for an addition to its boiler and power house to cost about \$35,000.

## South Atlantic States

BALTIMORE, April 4.

THE Braddock Glass Works, Inc., Cumberland, Md., recently organized, has leased a building formerly used by the Braddock Distillery, and will remodel for a new glass-manufacturing plant.

The City Council, Hagerstown, Md., will soon begin the construction of its proposed municipal electric light and power plant, to be two stories and basement, 123 x 165 ft., estimated to cost \$175,000 with equipment. L. T. Klauder, Bankers' Trust Building, Philadelphia, is engineer.

The Cardwell Machinery Co., 1900 Cary Street, Richmond, Va., has leased a building, 150 x 155 ft., and will remodel for a new works. It is purposed to remove the present plant to the new location.

Julius Herbst, 208 North Second Street, Wilmington, N. C., is planning the establishment of a local boat-building plant, and will soon purchase the necessary equipment.

The Bureau of Standards, Washington, George K. Burgess, director, will have plans prepared soon for a new power house for which an appropriation of \$200,000 has been granted.

The Charlotte Wagon & Auto Works, South Mint Street, Charlotte, N. C., manufacturer of automobile bodies, etc., is reported to be planning the establishment of a branch plant at Columbia, S. C. O. V. Hoke is president.

The Georgia Power Co., Atlanta, Ga., is said to have preliminary plans for a new steam-operated electric generating plant in the vicinity of Brunswick, Ga., to cost close to \$400,000 with machinery. A transmission line will be built. P. S. Arkwright is president.

The State Board of Welfare, Union Trust Building, Baltimore, has plans for a new three-story shop at the Maryland State House of Correction, Jessups, Md., to cost about \$100,000 with equipment. Theodore W. Pietsch, American Building, is architect.

The Southern Cotton Oil Co., Dawson, Ga., plans the rebuilding of the portion of its local plant recently destroyed by fire with loss estimated at close to \$75,000 with equipment. Headquarters are in the Produce Exchange, Annex D, Bowling Green, New York. T. C. Robinson is manager at Dawson.

The American Dining Room Furniture Co., Martinsville, Va., has plans for a new three-story factory, 70 x 100 ft., with L-extension, 70 x 70 ft., to cost about \$40,000 with equipment. D. H. Pannill is secretary.

The Portsmouth Cotton Oil Refining Corporation, Belt Line Railroad, Portsmouth, Va., is said to be planning the

installation of machinery for the manufacture of by-products, utilizing waste materials from its cottonseed oil mills.

The Dorchester Lumber Co., Badham, S. C., has inquiries out for a 50- to 75-kw. electric generator, belted or direct-connected, in addition to a larger unit previously announced.

The Willard Storage Battery Co., Atlanta, Ga., with plant at Cleveland, has awarded a general contract to the Massell Construction Co., 43 Peachtree Street, for a new two-story factory branch and distributing plant, 50 x 140 ft.

The Cudahy Packing Co., 111 West Monroe Street, Chicago, has concluded negotiations for the purchase of the three-story plant of the Blount Carriage Works, East Point, Ga., and will remodel for the production of cottonseed oil. It will cost about \$200,000 with machinery. Plans will be prepared by the company engineering department, South Omaha, Neb.

The Board of Education, Gaffney, S. C., is planning the construction of an addition to the high school for the installation of a manual training department.

The Americus Grocery Co., Americus, Ga., is planning the installation of a refrigerating and cold storage plant for fruits and vegetables.

The Kemp Machinery Co., Baltimore, has removed its offices from 215 North Calvert Street to larger quarters at 211 President Street.

## New England

BOSTON, April 4.

A SLIGHT improvement in machine tool sales in this territory was noted the past week. Business, however, is still confined to individual tools, and used equipment seems to have had a slight advance over new. The most important sale made recently was a new Milwaukee milling machine to a Massachusetts electrical equipment maker. Average sales of local dealers for the first quarter of 1927, figuring on the natural expansion as a result of the war, were normal.

There are still a number of live inquiries out, the most active apparently being from manufacturers of machine tools. In other industries, although realizing the necessity of new equipment, there is the same hesitation as in the past. The general industrial situation in New England, however, from the productive standpoint, is improving, although slowly.

The new Scituate waterworks, Providence, R. I., involves the installation of hydroelectric equipment. Charles T. Main, 200 Devonshire Street, Boston, is the engineer.

H. J. Bryant & Son, 334 Washington Street, Brookline, Mass., have plans in progress for a machine shop at Harvard Street and Alton Place, Brookline. A. Goodman is the owner.

The Builders Iron Foundry, 9 Coddling Street, Providence, has begun work on a one-story, 40 x 45 ft. core room addition, to cost with equipment \$103,000. Z. Chafee is president and treasurer. Plans are private.

Stone & Webster, Inc., Boston, has a general contract to build an addition for the Blackstone Valley Gas & Electric Co., Clinton Street, Pawtucket, R. I. Plans are private.

The Lawrence Machine Co., 361 Market Street, Lawrence, Mass., has awarded contract for a T-shaped plant, 75 x 122 ft., to cost \$175,000.

The Atmospheric Heating & Power Co., 35 Congress Street, Boston, has started work on a one-story, 40 x 118 ft. power plant at Malden, Mass.

The Bridgeman Machinery Co., Norwich, Conn., recently formed by H. Bridgeman Smith, head of the H. Bridgeman Smith Co., 487 Kent Avenue, Brooklyn, manufacturer of paper boxes and containers, is completing plans for the establishment of a new plant at Norwich to manufacture a new type of paper box-making machinery. The initial works will cost approximately \$50,000 with equipment. The Norwich Chamber of Commerce is interested in the project.

The Nash Engineering Co., South Norwalk, Conn., manufacturer of compressors, pumps, etc., has filed plans for a one-story addition, 100 x 105 ft. A portion of the structure will be used for distributing service.

The Hay & Peabody Cement Vault Co., 282 Somerville Avenue, Watertown, Mass., has awarded a general contract to E. J. Malanson, Somerville, Mass., for a two-story plant, 90 x 170 ft., for the manufacture of cast cement products, to cost about \$50,000 with equipment. D. T. Cormier, 15 Herbert Street, is architect.

The City Hall Square Garage, East Elm Street, Brockton, Mass., has plans under way for a new two-story service, repair and garage building, to cost about \$115,000 with equipment. Bids will soon be asked by F. A. Norcross, 46 Cornhill Street, Boston, architect.

The Colonial Marble Co., Rutland, Vt., has plans under way for a new one-story mill, 170 x 210 ft., to cost \$50,000 with equipment. A crane runway will be installed. Leo F. Caproni, 1056 Chapel Street, New Haven, Conn., is engineer.

The Remington-Noiseless Typewriter Corporation, 374 Broadway, New York, has acquired the plant and equipment of the L. R. Roberts Typewriter Co., Stamford, Conn., at a receiver's sale for \$75,000, and will occupy for a new branch plant as soon as the court ratifies the sale. Improvements will be made and additional equipment installed.

The Spencer Turbine Co., 486 New Park Avenue, Hartford, Conn., has awarded a general contract to the Lawrence & Coe Construction Co., 43 Farmington Avenue, for its one-story addition, to cost about \$25,000 with equipment. Buck & Sheldon, Inc., 60 Prospect Street, is architect and engineer.

The United Wire & Supply Co., 1497 Elmwood Avenue, Auburn, R. I., has incorporated as the United Wire & Supply Corporation, and will continue the same line of products as heretofore.

## Milwaukee

MILWAUKEE, April 4.

DEMAND for machine tools is limited by the conservative attitude of users, pending a more definite development of new business in their respective lines. On the whole, however, the outlook is more promising, and inquiry is showing renewed life. Automotive shops are manifesting greater interest, although no volume business appears to be before the trade. Replacement orders predominate the entire market. Prospects for April sales are considered better than any of the preceding five months.

The Edward F. Cumiskey Co., 126 Clinton Street, Milwaukee, manufacturing machinist, has awarded contracts for the construction of the first unit of its new plant on Fond du Lac Avenue. It will cost about \$35,000, including equipment. Edward F. Cumiskey is president and general manager.

The Bergstrom Stove Co., Neenah, Wis., manufacturer of cooking and heating stoves and ranges, warm air heating appliances, furnaces, etc., has acquired the entire plant and business of E. C. Dunning, Inc., 131 Reed Street, Milwaukee, specializing in the manufacture of furnace pipes and fittings, and employing about 50 workmen. The Bergstrom company has increased its capitalization from \$150,000 to \$200,000 and plans the erection of an addition. Meanwhile the Milwaukee plant will be continued in operation. E. C. Dunning has been elected secretary of the Bergstrom company and becomes general sales manager. George O. Bergstrom is president, and James W. Bergstrom, treasurer.

The Racine Universal Motor Co., Racine, Wis., has let the general contract to the William Christensen Construction Co., 1135 Mound Avenue, for the erection of its new plant, 60 x 250 ft., two stories and basement. The company manufactures fractional horsepower motors and motor-driven appliances. Benjamin Peterson is general manager.

The Common Council, Waupun, Wis., Richard Zimmerman, city clerk, will take bids after April 15 for the construction of a municipal sewage disposal plant and system, including a station, 32 x 100 ft., with two clarifiers, aeration tanks, separate sludge digestion tanks, two compressors and sludge pumps, three sludge beds and about 5300 lin. ft. of 18-in. outlet pipe. The work will cost about \$40,000. W. G. Kirchhoffer, Madison, Wis., is consulting engineer.

The Kiel Furniture Co., 3200 Center Street, Milwaukee, will build a power plant addition, 35 x 70 ft., requiring a 150-hp. boiler, feed water heater, coal and ash handling equipment, etc. The contract for the engine has been let. The mechanical engineer is Robert Cramer, 448 Twenty-seventh Street, Milwaukee.

The Boehck Machinery Co., 2404 Clybourn Street, Milwaukee, distributor of machine tools, contractors' equipment, mill supplies, etc., will build a one-story addition to its service building, 50 x 75 ft. Richard E. Boehck is president and general manager.

The Midwest Die Casting Co., Milwaukee, has been incorporated with an initial capitalization of \$10,000 to manufacture, die castings, tools, dies, jigs, fixtures, etc. The identity of the principals and definite plans for plant and production are withheld for the present. The interests are represented by Adolph Zingen and associates, 616 Michigan Street, Milwaukee.

The Edstrom Mfg. Co., Denmark, Wis., manufacturing tools, machinery and appliances, largely for agricultural purposes, has incorporated its business with an authorized capital stock of \$75,000. The principals are O. E. Edstrom, Alfred Rasmussen and F. W. Kriwanek.

Organization of the Wisconsin Appleton Co., which early this year acquired the real and personal property of the



Stowell Co., South Milwaukee, has been completed, and the plant will be operated as a jobbing foundry for the production of malleable castings. Alterations and improvements have been under way for some time.

The Acme Iron & Wire Works, 1929 St. Paul Avenue, Milwaukee, has been organized by Alvin C. and Milton C. Klinka, who were with the Banner Iron & Wire Works for 15 years, and will specialize in architectural iron work, wire work, fire escapes, etc.

Slicing Stokers, Inc., 6125 Plankinton Building, Milwaukee, has been incorporated with a capital stock of \$100,000 to distribute hand fired, mechanical and semi-mechanical stokers which will be manufactured under contract.

## Detroit

DETROIT, April 4.

THE Holland Furnace Co., Holland, Mich., manufacturer of domestic furnaces, has acquired the former plant of the Brandt Paper Co., Flint, Mich., and will remodel for a new factory branch.

The Acme Machine Products Co., Kalamazoo, Mich., has completed negotiations for the purchase of the Muncie Screw & Cap Co., Muncie, Ind., and will consolidate with its organization. It is proposed to continue the Muncie plant in service and an expansion program will be carried out. Fred R. Dowsett is president and general manager of the consolidated company; John N. Stetter, formerly general manager of the Muncie company, vice-president; L. W. Sutherland, treasurer; and C. L. Dibble, secretary.

Fred H. Locke, city manager, Grand Rapids, Mich., will take bids at once for a new pumping plant for the East-side sewage pumping station to cost about \$200,000. Hoad, Decker, Shoecraft & Drury, 308 South State Street, Ann Arbor, Mich., are engineers.

The American Radiator Co., 3007 Joseph Campau Avenue, Detroit, is said to be arranging an expansion program at its local plant, with installation of additional equipment.

Fire, March 26, destroyed a portion of the plant of the Pearson Boiler Works, Escanaba, Mich., with loss reported at \$22,000 including equipment.

The Universal Tile & Supply Co., 11900 Russell Avenue, Detroit, has tentative plans for a new plant at Flint, Mich., to cost close to \$200,000 including equipment. F. A. Richter is secretary, treasurer and general manager.

The Larsen Motor Sales Co., Muskegon, Mich., has plans in preparation for a three-story service, repair and garage building, 65 x 115 ft., to cost about \$80,000 with equipment. E. E. Valentine, Union Bank Building, is architect.

A controlling interest in the Mueller Brass Co., Port Huron, Mich., manufacturer of brass rods, tubings, castings, forgings, etc., has been secured by Oscar B. Mueller, president. An expansion and improvement program is being arranged, including the construction of additional units and the installation of machinery. The work will cost approximately \$500,000.

The American Brake Materials Co., Detroit, recently formed as a subsidiary of the American Brake Shoe & Foundry Co., 30 Church Street, New York, will operate a local plant for the manufacture of special automobile brake materials, to be known as Brakebloks. Percy Owen is head of the new company.

Robinson & Campau, Grand Rapids, Mich., architects, have plans nearing completion for a new six-story automobile service, repair and garage building, to cost close to \$175,000 with equipment.

The Roamer Motors, Inc., Kalamazoo, Mich., will devote a portion of its plant to the manufacture of commercial trucks in  $\frac{3}{4}$ -ton and  $1\frac{1}{2}$ -ton capacities, continuing the production of passenger automobiles as heretofore. The company will take over the plant of the Rutenbar Motor Co., Peru, Ind., for the manufacture of engines for the new motor trucks. A. C. Barley is president and general manager.

## Gulf States

BIRMINGHAM, April 4.

THE Humble Oil & Refining Co., Houston, Tex., affiliated with the Standard Oil Co. of New Jersey, 26 Broadway, New York, has plans for the construction of a new pipe line in the Panhandle and West Texas districts; a new trunk pipe line will also be built from McCamey, Upton County, to Corpus Christi, about 400 miles, with pumping and power equipment. The entire project will cost more than \$20,000,000. The company is disposing of a bond issue of \$25,000,000 to be used in connection with the work.

The Texas Central Power Co., Frost National Bank Building, San Antonio, Tex., has plans under way for a new hydroelectric generating plant on the Devil's River, near Del Rio, Tex., with initial capacity of about 6500 hp,

estimated to cost in excess of \$200,000, with power dam and transmission system. Claude S. Young is engineer in charge.

The Board of Regents, University of Texas, Austin, is asking bids until April 18 for the construction of a power plant at the institution. The Herbert M. Green Co., Santa Fe Building, Dallas, Tex., is architect.

The State Board of Administration, Montgomery, Ala., Charles A. Moffett, president, has approved plans for the erection of a new one-story shop at the Kilby State prison, 30 x 80 ft., for the manufacture of automobile license tags and other metal products, to cost \$50,000 with equipment.

The Houston Gulf Gas Co., Houston, Tex., operating natural gas properties, has arranged for a note issue of \$2,500,000, a portion of the proceeds to be used for expansion. William L. Moody, III, is vice-president.

The DeHass-Eby Lumber Co., Inc., Sorento, La., plans the installation of additional equipment at its mill, including a portable conveyor to handle bundles of shingles, box shooks, etc., with elevating apparatus.

The Buick Motor Co., Jacksonville, Fla., will soon begin the erection of a new four-story and basement automobile service, repair and garage building, estimated to cost \$150,000 with equipment. Robins H. Burroughs, 111 West Adams Street, is architect.

The Board of Education, Amarillo, Tex., plans the installation of manual training equipment in a proposed addition to the high school to cost \$120,000, for which an appropriation has been granted.

The Empire Gas & Fuel Co., Wooster, Ohio, a subsidiary of the Cities Service Co., 60 Wall Street, New York, is reported to be planning the construction of a pipe line for natural gas service from the Texas Panhandle fields to Kansas City, Mo., and vicinity, with compressor stations, etc., to cost close to \$15,000,000.

The Faulkner Concrete Pipe Co., Hattiesburg, Miss., is completing plans for the construction of a new plant at Mobile, Ala., where site has been secured. The initial unit will be one story, 60 x 200 ft., to cost about \$50,000 with equipment. The machinery installation will provide for an output of about 40 tons of concrete pipe per day, including sizes from 6 to 36-in. diameter. The company will also build a similar plant at Jackson, Miss., to cost \$50,000. L. E. Faulkner is president.

The South Texas Motor Co., Houston, Tex., has plans nearing completion for a new two-story service, repair and garage building, to cost \$90,000 with equipment. Robert L. Vogler, Houston, is architect.

The Missouri Pacific Railroad Co., Railway Exchange, St. Louis, is planning for extensions in its car and locomotive shops at San Antonio, Tex., including the installation of drill presses, lathes and other equipment, with 15-ton electric traveling crane and crane runway. The project will cost about \$50,000. E. A. Hadley is chief engineer.

The Columbian Gasoline Corporation, Shamrock, Tex., plans to rebuild the portion of its gasoline extraction plant at Shamrock recently destroyed by fire, with loss reported in excess of \$65,000 including equipment.

The Pullman Car & Mfg. Corporation, Chicago, has acquired a controlling interest in the Dickson Car Wheel Co., Houston, Tex. Extensive changes are not contemplated at this time either in personnel or plant equipment.

## Indiana

INDIANAPOLIS, April 4.

BIDS will soon be asked by the Board of Trustees, Howe Military School, Howe, Ind., for a new one-story power plant, 60 x 100 ft., to cost \$55,000 with equipment. Charles R. Weatherhogg, 250 West Wayne Street, Fort Wayne, Ind., is architect.

The Millsbaugh & Irish Co., 730 North Washington Street, Indianapolis, manufacturer of automobile bodies, is considering extensions and improvements in its plant to cost \$70,000.

The Plymouth Body Works, Plymouth, Ind., manufacturer of automobile bodies, is said to be planning the construction of a new one-story plant, to cost more than \$25,000 with equipment.

D. A. Boswell, 1155 Portage Street, South Bend, Ind., and associates have plans for a three-story automobile service, repair and garage building, 66 x 170 ft., to cost close to \$100,000 with equipment.

The Board of School Trustees, Oakland City, Ind., plans the installation of manual training equipment in its proposed two-story and basement high school to cost \$115,000, for which bids will soon be asked on a general contract by Harry E. Boyle & Co., Furniture Building, Evansville, Ind., architects.

P. J. Ryan, 540 Central Court, Indianapolis, has filed

plans for a two-story machine and repair shop, 35 x 110 ft., to cost about \$20,000 with equipment.

Lynn B. Lewis, 319 North College Avenue, Bloomington, Ind., local representative for the Nash automobile, will take bids at once for a new two-story service, repair and garage building, 84 x 135 ft., to cost about \$60,000 with equipment.

The Perfect Circle Co., Hagerstown, Ind., manufacturer of piston rings, is preparing to start a foundry at its New Castle, Ind., plant in which its castings will be made. The foundry will be in charge of S. A. Norrick, and purchases will be made by C. R. Teeter, assistant treasurer.

## Cincinnati

CINCINNATI, April 4.

**M**ACHINE tool buying has fallen off sharply in the past 10 days and, with only a few exceptions, orders have been confined to single machines from widely diversified sources. Railroad purchases practically are at a standstill, while sales to automobile manufacturers have been light. Inquiries continue in good volume, but the percentage converted into actual business has been low. Opinion in the trade regarding the outlook for the next two months is divided. Some executives are confident that a fair proportion of the quotations now pending will be closed, whereas others believe that April, and possibly May, will be quiet. A local builder has sold seven engine lathes to a railroad in Brazil. The Texas & Pacific has purchased a 6000-lb. double frame steam hammer.

The Dayton Power & Light Co., Dayton, Ohio, is planning the expenditure of approximately \$2,000,000 during 1927 as a part of its expansion program. Of that sum, \$1,000,000 will be appropriated for improving the distribution system, \$750,000 for the establishment of new stations and substations, and \$250,000 for installation of new gas mains and other equipment.

The Kentucky Engineering Co., Inc., Augusta, Ky., has been organized to do general construction and engineering work largely in connection with extensions of the Kentucky Power Co., of which it is a subsidiary. It will also accept outside contracts.

The Ohio Knife Co., Dreman Street and the Baltimore & Ohio Railroad, Cincinnati, has awarded a contract to Carl Mielke & Son, Cincinnati, for a one-story addition.

The Sterling Pump Works, Stuttgart, Ark., A. J. Powell, manager, is reported to be planning the construction of a new plant in the vicinity of Memphis, Tenn., to cost more than \$100,000 with equipment.

Rodgers & Co., Knoxville, Tenn., are in the market for several electric motors, small capacities, with flexible drive shafts.

The Chattanooga Gas Co., Chattanooga, Tenn., is said to be planning for extensions and improvements in its water-gas plant equipment installation to include boilers and other power machinery, to double the present capacity.

The Forbes Mfg. Co., Hopkinsville, Ky., manufacturer of chairs and other furniture, is completing plans for rebuilding the portion of its factory recently destroyed by fire. It is estimated to cost more than \$50,000 with equipment. James M. Forbes is president.

The City Council, Petersburg, Tenn., plans the installation of pumping machinery and auxiliary power equipment in connection with a proposed municipal waterworks to cost \$40,000.

The Dayton Industrial Association, 922 Dayton Savings and Trust Building, Dayton, Ohio, C. H. Paul, manager, is interested in a project to construct and operate a local brass foundry, to cost more than \$100,000 with equipment. The name of the company is temporarily withheld.

The Kingsport Brick Co., Kingsport, Tenn., will make extensions in its plant, including a new machine and grinding department, 40 x 150 ft., with installation of additional equipment. The entire project will cost close to \$150,000.

The Public Light & Power Co., Cowan, Tenn., has been granted permission to install and operate an electric light and power plant. The company has recently secured authority to issue bonds for \$427,000, a portion of the fund to be used for extensions and improvements. It is operated by the Southern Cities Power Co., Provident Life Building, Chattanooga, Tenn.

The Newman Mfg. Co., 416-18 Elm Street, Cincinnati, manufacturer of architectural brass, bronze and other metal products, has acquired a five-story building, and will remodel for an addition. The expansion will provide for more than 100,000 sq. ft. of floor space at the two plants.

## Pittsburgh

PITTSBURGH, April 4.

**S**ALES of machine tools the past week showed improvement, largely due to orders from the American Sheet & Tin Plate Co., which placed 18 machines among four or five dealers for its new Gary tin mills. The Carnegie Steel Co. also bought a good sized punch and shear for its Clairton works. March as a whole did not produce as much business as the trade had expected in view of the number of inquiries against which quotations have been outstanding for some time, nor has new inquiry been particularly active. The Board of Education, Johnstown, Pa., has issued a list of 64 items for vocational schools, but only a few machine tools are wanted.

Bids will be received by the United States Engineer, Pittsburgh, until April 27, for the construction of three steel maneuver boats, 60 ft. long, to include steam boilers and pumps, steam capstan, hoisting engine and auxiliary machinery, circular 395.

Ovens, power equipment, conveying and other machinery will be installed in the addition to be constructed at the plant of the Seven Baker Brothers, Inc., Wabash and Lowe Streets, Pittsburgh, estimated to cost \$300,000. The W. E. Long Co., 155 North Clark Street, Chicago, is architect.

The Appalachian Electric Power Co., Bluefield, W. Va., has acquired about 15 acres at Sprigg, W. Va., and plans the construction of a new steam-operated electric generating plant.

J. F. McWilliams, 127 North Highland Avenue, Pittsburgh, architect, has revised plans for a three-story automobile service, repair and garage building on West Liberty Avenue, to cost about \$110,000 with equipment.

The Star Service Hanger Co., 2015 Preble Avenue, Pittsburgh, has leased property, 33 x 135 ft., for expansion.

The Sheehan Tire & Battery Service Co., Adams and Bedford Streets, Johnstown, Pa., is completing plans for a new service and repair building, three-stories, to cost about \$45,000 with equipment. O. P. Thomas, Park Building, is architect and engineer.

The Union Switch & Signal Co., Swissvale, Pa., has taken bids for a new five-story building to cost in excess of \$300,000. Janssen & Cocken, Century Building, Pittsburgh, are architects.

## Pacific Coast

SAN FRANCISCO, March 30.

**C**ONTRACT has been let by the Orton Machine Co., 325 Fremont Street, San Francisco, to H. P. Hoyt, for a one-story machine shop, to cost about \$20,000.

The Master Metalath Mfg. Co., 6100 St. Andrews Place, Los Angeles, has filed plans for a new one-story plant, 90 x 120 ft., for the manufacture of expanded metal lath specialties. It is estimated to cost close to \$21,000 with equipment.

The City Council, Pasadena, Cal., has authorized plans for extensions in the municipal electric light and power house, including the installation of a 15,000-kw. generating unit and accessories, estimated to cost \$720,000.

Work is under way on a new three-story and basement factory for the Pacific States Electric Co., San Francisco, estimated to cost \$350,000 with equipment. It is expected to be ready for occupancy early in the summer. Hunter & Hudson, Rialto Building, are engineers.

The Post-Taylor Garage, Inc., San Francisco, has begun the erection of a four-story and basement service, garage and repair building to cost \$200,000. O'Brien Brothers, 315 Montgomery Street, are architects.

The Board of Trustees, University of Idaho, Moscow, has authorized plans for a new power plant to cost about \$75,000 with equipment. L. F. Parsons is executive secretary.

The Northwestern Portland Cement Co., Dexter-Horton Building, Seattle, has awarded a general contract to the Pacific Iron Works, Clackamas Street, Portland, for extensions at its plant at Grotto, Wash., consisting of machine shop, electric power substation, compressor plant, laboratory and other structures, to cost about \$450,000 with equipment.

The Salt Lake Radio & Mfg. Co., Salt Lake City, Utah, has plans under way for a new one-story factory, 60 x 200 ft., to cost about \$25,000 with equipment. Ross S. Lund is president.

The City Council, Tulare, Cal., has plans under advisement for a municipal electric light and power plant, and will soon secure estimates of cost.

The Earl C. Anthony Co., Oakland, Cal., local representative for the Packard automobile, has acquired property



as a site for a new two-story service, repair and garage building to cost about \$115,000 with equipment. It is understood that Bernard Maybeck, Lick Building, architect, will prepare plans.

The Southern California Edison Co., Los Angeles, has authorized plans for a new one-story automatic power substation at Pasadena, Cal., to cost about \$130,000 with equipment. It will also make extensions and improvements in its station and lines at Orange, Cal., and vicinity, to cost about \$100,000.

The Electrical Products Corporation, 1128 Venice Boulevard, Los Angeles, manufacturer of electric signs and displays, has leased property at Fresno, Cal., for the establishment of a new branch plant.

The San Joaquin Pump Co., Fresno, has been formed by George W. Wilson, Fresno, to operate a plant at 2232 Railroad Avenue for the manufacture of pumping equipment and parts. Operations will begin at once.

Construction is nearly finished on a factory containing 30,000 sq. ft. of floor space for the Merco Nordstrom Valve Co. at Twenty-fourth and Peralta Streets, Oakland, Cal., to be devoted exclusively to the manufacture of plug valves. Heretofore the valves have been manufactured at Belleville, N. J. The company is a subsidiary of the Merrill Co. of San Francisco. The officers are Charles C. Broadwater, president; Sven Johan Nordstrom, vice-president; Herbert S. Shuey, secretary-treasurer. Directors include Charles W. Merrill and Louis D. Mills, president and consulting engineer, respectively of the Merrill Co.

The Oregon Iron & Steel Co., Oswego, Ore., has been purchased for approximately \$100,000 by Ward C. Smith, Oswego, and Lewis R. Banks, Portland, Ore. The plant will be remodeled for the manufacture of cast iron products.

## Canada

TORONTO, April 5.

WITH improvement in industrial conditions, demand for machine tools is steadily increasing. Local builders and dealers report a high record of sales for the month of March and, according to present indications, orders in April will be correspondingly large. Inquiries for equipment for plants now under construction or contemplated are appearing and dealers are looking forward to good sized orders. Single tool sales are more numerous and a good volume of business has developed from practically all districts of the Dominion. The automotive industry is buying more freely and sales to garages and repair plants are fairly brisk. A good demand is also reported for mining machinery and small tools for mining development work.

Fess Oil Burners, Ltd., 65 Trinity Street, Toronto, will start work immediately on the erection of a manufacturing plant at 514 King Street East, to cost \$55,000.

Bids will be called by the St. Regis Paper Co., 30 East Forty-second Street, New York, about May 19 for the erection of a pulp and paper mill at Cap Rouge, Que., to cost approximately \$1,000,000.

The Canadian American Copper Refining Co., Ltd., 87 Notre Dame Street West, Montreal, will start work immediately on a copper refining plant at Eastman, Que., 100 x 300 ft., of reinforced concrete construction. It will cost approximately \$300,000.

The Stanley Steel Co., Gerrard Street, Hamilton, Ont., will start work at once, by day labor, on an addition to cost \$50,000.

The Town Council, Bromptonville, Que., will build new waterworks and sewage plants to cost \$150,000. A. Crepeau, 30 A. Wellington Street, Sherbrooke, Que., is engineer.

Plans are being prepared for an addition to the plant of the Western Clock Co., Ltd., Peterborough, Ont. B. H. Prack, 42 James Street North, Hamilton, is architect.

Plans are being revised by A. G. Stringer, architect, 53 MacLean Avenue, Toronto, for a larger plant for the Hobbs Storage Battery Co. of Canada, Ltd., Toronto.

The L. & P. Mfg. Co., Niagara Falls, Ont., has awarded a general contract to A. W. Zimmerman, for the erection of a machine shop.

The Corrugated Cattle Cake & Cottonseed Oil Co., Ltd., 66 Temperance Street, Toronto, has let a general contract to the Roberts Construction Ltd., 81 Victoria Street, for the erection of a factory, to cost \$45,000.

Bids will be called about May 1 by the Power Corporation of Canada, Ltd., engineer, 20 St. Nicholas Street, Montreal, for the construction of a power plant on the Back River, Visitation Island, River des Prairies, Que., for the Montreal Island & Power Co. It will represent an expenditure of approximately \$8,000,000.

The Minas Basin Pulp & Paper Co., Windsor, N. S., has been formed with a capital stock of \$100,000 and is seeking a site for the erection of pulp and paper mills. Major Doering, assistant secretary of the Board of Trade, is interested.

## Western Canada

Bids will be called immediately for an addition to the power house at the Weston shops, Winnipeg, for the Canadian Pacific Railway.

The Western Steel Products, Ltd., St. Boniface, Man., has let the general contract to the Carter-Halls-Aldinger Co., Ltd., Royal Bank Building, Winnipeg, for an addition to its plant.

The Western Hardware & Metal Co., Ltd., Winnipeg, proposes to establish a wire rope manufacturing plant at Vancouver, B. C., where about 50 men will be employed.

The Yorkton Oil & Refining Co., Yorkton, Sask., plans the immediate construction of an oil refinery. The company has a capital stock of \$300,000.

## Foreign

THE Lago Oil & Transport Co., Ltd., 120 Broadway, New York, has arranged for an increase in capital from 4,000,000 to 5,500,000 shares of stock, a portion of the proceeds to be used for the acquisition of additional oil properties in Venezuela and for development work in that country, including production facilities, storage plants, pipe lines, etc.

The City Council, Dresden, Germany, is considering the construction of water storage plants at Niederwartha and Oberwartha, for hydroelectric generating plant service, with installation of electric pumping equipment and other power facilities. The project is estimated to cost close to \$5,000,000. The American Consulate, Dresden, A. T. Haeberle, consul, has information regarding the project.

The Government of Madagascar, Tananarive, plans the construction of railroad shops for reconditioning and repair work in connection with a proposed new line from Fianarantsoa to a terminal port, Manakara, on the east coast, about 105 miles. The road will cost close to \$4,750,000 with equipment. Contract for the construction has been let to French interests. Information at the office of the Bureau of Foreign and Domestic Commerce, Washington, reference 238885. The American Consulate, Paul D. Thompson, vice-consul, Tananarive, also has information regarding the project.

Following its recent purchase of electric light and power utilities in the Bahia and Rio de Janeiro districts, Brazil, the General Electric S. A. of Brazil, operated by the International General Electric Co., 120 Broadway, New York, has concluded arrangements for the purchase of the plant and properties of the Tramway, Light & Power Co. of Victoria from the State Government of Espirito Santo, Brazil. The new owner plans extensions and betterments.

The Burmah Oil Co., Rangoon, Burma, is considering plans for the electrification of its properties in the Singu oil-fields. The project is expected to be carried out in conjunction with the British Burma Petroleum Co. The American Consulate at Rangoon, Charles J. Pissar, consul, has information on the enterprise.

Ram Dhan & Sons, Jullundur City, India, engineers and contractors, of which S. R. Mehendru is manager, have asked THE IRON AGE to publish the fact that they are in the market for various articles in lots of 50 to 200 cases as follows: Hinges, wood screws, door bolts, brass wire gauze, copper

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wire gauze, galvanized wire netting, perforated zinc sheets, files, saw blades, hand saw blades, iron nails, wire nails and other items. Specifications are on file in the office of THE IRON AGE.

## Industrial Finances

Wickwire Spencer Steel Co., Inc., New York, in its annual report for 1926, shows a net loss after provision for depreciation of \$854,357, compared with a loss of \$348,000 in 1925. The company had a net profit from operations of \$1,386,615, and charges without depreciation amounted to \$1,732,795.

Net profit last year of the General Electric Co., Schenectady, N. Y., amounted to \$44,314,884, equivalent after common stock dividends to \$24,485,988 available for addition to surplus, and compared with \$36,905,641 and \$22,498,097 respectively in 1925. Sales billed totaled \$326,974,104, compared with \$290,290,166 in the previous year, and making 1926 the largest year in the company's history. Surplus as of Dec. 31, 1926, amounted to \$103,123,348, compared with \$85,848,171 one year before.

International Harvester Co., Chicago, in the best year since 1919, shows net profits for 1926 of \$22,658,891, equivalent after preferred dividends to \$18.12 a share on the common stock, and compared with \$19,171,240 or \$14.82 a share in the previous year. During the year the company spent \$14,334,995 for improvements to its various properties, having a total property value of \$95,440,940 at the close of the year, not including reserve for depreciation. Inventories at the end of the year amounted to \$88,713,536.

The Sloss-Sheffield Steel & Iron Co., Birmingham, shows net profits for 1926 of \$2,106,759, equivalent after all charges to \$16.37 a share on the 100,000 shares of common stock. Last year the company earned \$1,978,941 or \$15.09 a share. Surplus at the end of 1926 amounted to \$10,033,912 as against \$9,496,177 one year ago.

Ingersoll-Rand Co., New York, had a net income during 1926 of \$7,878,097, equal after preferred dividends and other charges to \$7.72 on the 1,000,000 shares of no par common stock. This compares with \$6,147,444 or \$5.99 a share in the preceding year.

The Standard Screw Co., 15 Exchange Place, Jersey City, reports net income for the year ended Dec. 31, 1926 of \$669,913. After paying dividends on common and preferred stock the company had a surplus of \$2,704,320, as compared with \$2,678,954 one year ago.

The Phelps Dodge Corporation, 99 John Street, New York, reports net income for 1926 of \$4,869,667, before depletion, but after provision for depreciation. The company's net sales for the year amounted to \$38,141,779, and surplus account, as of Dec. 31, 1926, totaled \$74,087,255, after deductions for depletion and dividends declared.

The Midvale Co. and subsidiaries, Nicetown, Philadelphia, for the year ended Dec. 31, 1926, report net profit of \$642,463, after deducting \$460,000 for depreciation, equivalent to \$3.21 a share earned on the 200,000 shares of no par stock outstanding, and compared with \$394,146 or \$1.97 a share in the previous year. The company has current assets, as of Dec. 31, of \$5,888,219, including cash in banks and on hand of \$2,654,568 and inventories of \$2,560,476.

The Canadian General Electric Co. in its 1926 annual report showed gross profits after reserves and taxes, but before providing for depreciation, amounting to \$1,870,618. This represents an increase of \$253,525 over 1925 and the highest profits since 1920.

The Canadian Westinghouse Co., Ltd., for the twelve months ended Dec. 31, 1926, showed operating profits of \$1,796,741 equivalent to \$18.30 a share on the capital stock as compared with \$1,473,386, or \$14.40 in 1925.

"The Hydraulic Press" is the name of a new house publication to be issued quarterly by the Hydraulic Press Mfg. Co., Columbus, Ohio. The first issue is semi-technical in nature, and contains several articles of general interest to manufacturers in the industrial field. Beginning with the next issue a special series of articles dealing with the hydraulic transmission of power will be published.

Sudbury, Ont., proposes to offer a free site to the Bunker Hill & Sullivan Co., for the erection of a lead and zinc smelter within the town.

## NEW TRADE PUBLICATIONS

**Steel Mill Equipment.**—F. H. Crawford & Co., 50 Church Street, New York, and Leader News Building, Cleveland. Catalog of 24 pages detailing a great variety of steel mill equipment available, including buildings, a complete open-hearth plant of 200,000 tons annual capacity, rolling mills, strippers, cranes, charging machines, a 30-in. and a 34-in. reversing bloomer, ladles, charging box cars, engines, annealing furnaces, power hammers, and cold drawing and rolling equipment. Illustrations are from photographs and drawings. Specifications of the various pieces of equipment are in considerable detail.

**Heat Insulation.**—Phillip Carey Co., Cincinnati. Reprint of an article by L. E. Whitaker, which was published in *Power*, May 18, 1926, deals with choosing economical thickness of heat insulation. Eight diagrams show heat losses, etc., in various sizes of pipe and other surfaces at varying temperatures, and with different types and thicknesses of insulation. A four-page circular deals with the thermal conductivity of laminated asbestos coverings. Ability of coverings to withstand rough treatment is a feature of this pamphlet.

**Air Filters.**—Reed Air Filter Co., Inc., Louisville, Ky. Bulletin dealing with the company's Streamline automatic self-cleaning air filter. The filtering media consist of staggered rows of forms similar to low wind resistance shapes developed in airplane construction, and the flooding or flushing method of cleaning is employed.

**Oxygen Manifolds.**—Air Reduction Sales Co., 342 Madison Avenue, New York. Catalog section 6 describing Airco-Davis-Bournonville oxygen manifolds for use in the pipe line distribution of oxygen and acetylene.

**Truck Wheels and Casters.**—Divine Brothers Co., Utica, N. Y. Price list No. 20 covers 16 pages of illustrations and tables of specifications and prices of truck wheels and casters of steel, and others with protective treads.

**Shovels.**—Ames Shovel & Tool Co., Boston. Catalog 152 providing various information, photographs and specifications of the types and grades of shovels manufactured by the company. Shovels for the foundry are also dealt with in more detail in a smaller booklet entitled "Oliver Ames Shovels for the Foundry."

**Hoisting Equipment.**—Revolator Co., 336-352 Garfield Avenue, Jersey City. Bulletin 90-H dealing with the company's HSG silent noist a particular feature of which is its ability to sustain a load as soon as pressure on the crank handle is relaxed.

**Grinding Equipment.**—Patterson Foundry & Machine Co., East Liverpool, Ohio. Booklet describing the company's ball and tube mills with special attention to their operation in closed circuit with centrifugal separators, screens, classifiers and such. Illustrations and descriptions of various types of feeding devices, motor driven machines and tables of standard sizes manufactured are also included.

**Steel Gratings.**—Irving Iron Works Co., Long Island City, N. Y. Leaflet devoted to the various types of subway grating manufactured by the company. Of especial interest is the table of safe loads with specifications on types of gratings required for various purposes.

**Steam Drainage and Boiler Feeding.**—Morehead Mfg. Co., Detroit. Catalog 15 of 44 pages gives details of equipment provided by the company, in the shape of return, condenser, vacuum, non-return and variable-pressure tilting steam traps. There are many illustrations, while the usual tables pertinent to the subject are carried. The catalog is bound in a folder to fit a 9 x 12 in. letter file.

**Railroad Dynamometer Car.**—Alfred J. Amsler & Co., Schaffhausen, Switzerland. Pamphlet of 32 pages with 48 illustrations, going into great detail in describing a dynamometer car used for experimental purposes to determine the work done by railroad locomotives. Cars of this type are listed as having been installed on railroads in France, Belgium, Italy, Germany, Russia, Switzerland, Sweden and Czechoslovakia in Europe, as well as in Java, South Manchuria and Argentina. The theory of the apparatus is worked out mathematically in the text, with numerous diagrams illustrating the development of the work. Copies of the pamphlet may be obtained from the company on request.

**Wire Fence.**—Cyclone Fence Co., Waukegan, Ill. Leaflet showing installations of the company's product on industrial properties. Estimates of probable costs and types needed in particular cases are included.